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China Report

AGRICULTURE

No. 100

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I. GENERAL INFORMATION

TORRENTIAL RAINS CLASSIFIED; DAMAGE RECALLED

Beijing RENMIN RIBAO in Chinese 7 Jun 80 p 2

[Article by Zhang Shangyin [1728 1424 0603] of the Central Meteorological Observatory: "The Disastrous Weather That Is Common in Summer--Torrential Rains"]

[Text] Torrential rains are a disastrous form of weather common to the summertime. Ours is a land where numerous torrential rains occur annually. Torrential rains can shatter roadbeds, burst dams, and destroy bridges, inundate crops, and create soil erosion. Worst of all are the floodwaters, caused by torrential rains, that cause rivers to overflow.

Since the intensity and duration of downpours differ, rains have been classified as light, moderate, heavy, and torrential. In actual practice, torrential rains are further divided into heavy torrential rains and especially heavy torrential rains. When the daily accumulation of rainfall adds up to more than 50 millimeters, it is termed a torrential rain [baoyu 2552 7183]. When it is more than 100 millimeters, it becomes a heavy torrential rain [dabaoyu 1129 2552 7183], and when more than 200 millimeters, an especially heavy torrential rain [tedabaoyu 3676 1129 2552 7183]. Since ours is a vast land spanning high, medium, and low latitudes, and in which the eastern and southeastern portions face large oceans, there are great differences in the amount, frequency, and intensity of rainfall between south and north, coast and the interior. Consequently, different regions have formulated different standards for measuring torrential rains in accordance with their local areas. In South China, rainfall in excess of 80 millimeters per day is termed a torrential rain, while in the northwest 30 millimeters is the standard for a torrential rain.

Seasonal changes in atmospheric circulation bring about a seasonal displacement in the major rainfall belts of the globe. Our country is a monsoon climate region, and therefore as the subtropical high pressure shifts northward at the end of spring and the beginning of summer, the southwest monsoon and the southeast monsoon gradually intensify, bringing large amounts of warm humid air from the Bay of Bengal, the South China Sea, and the East China Sea to the mainland of our country and bring about torrential rains and the flood season. Every year from April to June, South

China enters the early flood season, and during June and the first half of July, the area of rain extends to the area of the Yangtze and Huai rivers. During the last half of July and August, the area of rains spreads to North China and the southern part of the Northeast, bringing these areas into the summer torrential rain and flood season. Because of the effects of typhoons, which bring frequent torrential rains to South China and the area below the Yangtze River during July and August, this period is called the late flooding season. Once September has passed, an intensification of cold air activity takes place and the torrential rains cease.

The distribution of torrential rains is heavy in the south and light in the north; heavy in coastal areas, and light in the interior. Taiwan Province and the islands in the South China Sea are the places in our country where the number of days of rainfall is greatest, while on the inland plateaus and deserts of our country's northwest, there are scarcely ever any torrential rains all year long.

Since liberation, three disastrous torrential rains have occurred. The first was during June and July 1954, when exceptionally heavy flooding took place in the Yangtze River basin, and overflowed the Dongting Lake, Boyang Lake, and other lakes large and small. The second time was in early August 1963, when torrential rains fell in North China. On 4 and 5 [August], 865 millimeters of rain fell daily at Zhangyao in Xingtai Special District. Between 5 and 8 August 1978, as a result of low pressure formed when a typhoon abated upon reaching land, three prefectures in Henan Province--Zhumadian, Xuchang, and Nanyang--suffered especially torrential rains such as have been rarely seen in history. During the period from 4 to 8 [August], the total quantity of rainfall amounted to 1,631.1 millimeters. Reservoirs burst their dams and rivers went on the rampage, overflowing their banks and creating havoc.

The last half of last year and the first half of this year have been periods of peak sunspot activity. Sunspot activity inevitably produces short-term and long-term effects on the earth's atmospheric activity, and weather and climate may undergo some abnormal changes. During the past 10 years the North China region has had [illegible] years of dry weather, while this year the easterr part of that region has had continuous overcast weather and an inordinate amount of rainfall. During the last 10 days of April, Guangdong was visited by constant torrential rains, which flooded the fields. This spring, torrential rains have been more frequent and more violent in South China than in previous years. In view of the nature of the weather this spring in North China and South China, torrential rain activity in both the north and the south of our country may show abnormal changes. Therefore, it is extremely important to be on guard against the occurrence of especially heavy torrential rains and to strengthen action against flooding.

9432
CSO: 4007

PRC CENTRAL METEOROLOGICAL OBSERVATORY ISSUES TYPHOON WARNING

OW191616 Beijing Domestic Service in Mandarin 1200 GMT 19 Aug 80

[Text] The Central Meteorological Observatory issued a typhoon warning at 1800 today.

The No. 1 typhoon of this year is brewing over the northern part of Bei Bu Wan [Tonkin Gulf]. At 1700 the center of the typhoon was located at 21.4 degrees north latitude and 108.3 degrees east longitude. Maximum winds near the typhoon center are of wind force 9 in intensity. The typhoon center is expected to move northwest at a speed of approximately 15 km per hour. It is expected to strike the coastal area bordering China's Guangxi region and Vietnam this evening, after which it will continue to move northwest and gradually subside to a low pressure system.

Affected by the typhoon, the northern part of Bei Bu Wan and Guangxi's coastal regions are expected to experience winds of force 6-7 in intensity. The areas near the center of the typhoon are expected to experience winds of force 8-9 in intensity. The southern part of Guangxi, Leizhou Peninsula and Hainan Island will experience torrential rains.

It is requested that departments concerned listen to the typhoon forecast reported by local meteorological observatories and stations.

CSO: 4007

PRC AGRICULTURE MINISTRY POPULARIZES NEW AGROTECHNIQUES

OW231702 Beijing XINHUA Domestic Service in Chinese 1310 GMT 22 Aug 80

[Text] Beijing, 22 Aug--To popularize agrotechniques, the Ministry of Agriculture recently invited responsible persons of agroscientific, production and educational units to a meeting held in Beijing. Participants discussed and formulated a plan for demonstration and popularization of 19 key agroscientific items in 1980. They also decided on subsidy funds to be allocated for demonstration and popularization and signed contracts with units concerned.

Among the 19 key items for demonstration and popularization include 14 items related to farming. They are: New rice strains "Zhong Dan No. 1" and "Zhong Dan No. 2"; new winter wheat strain allo-octo-ploid triticale [yi yuan ba bei ti xiao hei mai 3976 3292 0260 0223 "jian 26"; 7555 1420 7815 7796]; high nutrition hybrid corn strain "nong da 101"; utilizing the heterosis (or hybrid vigor) of cotton; utilizing the heterosis of the first generation hybrid vegetable seeds; plastic film ground cover; new strains of watermelon "jingsu" and "zhouzhihong"; the "ye ling zhi biao cu kong fa" [0673 0109 2172 2871 0191 2235 3127] cultivation technique of wheat; high-yield cultivation technique for large-scale acreage of rapeseed; the technique of utilizing ethylene for early ripening of rapeseed; the technique of deep application of chemical fertilizer and ball fertilizer; popularization of humic acid fertilizers on a trial basis; and a new antibiotic for farm use--"duo xiao mei su" [1122 2400 7199 4790].

Two of the items are related to livestock and veterinary, namely, the demonstration and popularization of the new techniques for breeding fine honeybee strains by artificially placing bee ova into beehives and the injection of triple vaccine in pigs.

Three of the items are related to marsh gas, namely, the technique of sealing selected types of marsh gas pits; semimechanized dung applicator model IX-1 which is capable of self-scooping and self-dispensing and Jialing No. 1 dung carrier; new model stoves with a thermal efficiency of around 60 percent.

These key items have undergone years of test and demonstration and have been proved practical. Many new agricultural varieties and advanced cultivation techniques have shown great potential in boosting production on small acreage demonstration farms. For instance, output of a hybrid cotton strain popularized by the Sichuan agricultural department in Nanchong prefecture's 5 counties in 1977 increased by more than 20 percent over regular fine cotton strains. In addition, the cotton fibers are longer and of better quality. Moreover, each mu of hybrid cotton can yield 40 yuan more in income than for each mu of regular fine cotton strains.

Since the oil-bearing crops institute of the Chinese Academy of Agricultural Sciences adopted the high-yield triple-cropping cultivation technique--rice-rice-rapeseed--in Hubei's Guangji County in 1977, output has increased by a big margin in successive years. This shows that this cultivation technique is completely suitable for large-scale popularization on rapeseed and other oil-crop producing areas in the south.

CSO: 4007

TEMPERATURE-RAISING AGENT FOR SOIL IN RURAL CHINA

Peshawar KHYBER MAIL in English 21 Jul 80 p 3

[Article by Tian Sang]

[Text] Come to rural China in early Spring 10-20 days earlier than the usual seeding time and you will find green seedlings breaking through a dark, glistening thin film covering the seedbeds.

This thin and silk-like coating is a chemical cover formed by a kind of temperature-raising agent now being popularized in rural China.

Application is very simple. The paste-like agent is diluted with four to six times of water, sprayed on seedbeds or farmland and it will do the trick. An hour later, the agent will turn into a dark, paper-thick coating which will effectively reduce the water evaporation and heat loss of the soil and increase its absorption of solar heat, thus raising the temperature of the soil and preserving its moisture.

Observations conducted in various parts of the country by a group of experts from the Geographical Research Institute of the Chinese Academy of Sciences proved that with the use of such agent, water evaporation of the soil could be reduced by 75 percent and the average daily temperature of the top soil increased by two to five degrees Centigrade. The highest temperature increase of 15 degrees Centigrade was registered at noontime.

This dark film helps speed up the transformation of organic substances in the soil into absorbable inorganic ones by activating the micro-organisms in the soil. It is neither harmful to the soil structure, nor to the growth of crops, nor to the domestic animals and human beings. The film will gradually break up in some 40 days after the seeds have sprouted and become soil nutrient.

Being popularized in the rural areas of 15 provinces, municipalities and autonomous regions, the temperature-raising agent is applicable for the nursing of cotton, rice, maize, vegetable and sweet potato seedlings and tree saplings in early Spring, remarkably increasing the output of the crops.

Take cotton in central China for instance. With the use of the agent, sowing time can be 15-20 days earlier than usual and output is 20-30 percent higher. In the case of maize grown in China's northeast, sowing time is ten days earlier with a 10-20 percent higher output. When the agent is applied in growing seedlings of rice in north and central China, sowing time is 10 days earlier and the output is 10 percent higher. For vegetables in north and northeast China, sowing time is eight to ten days earlier, marketing time four to six days earlier, and output 15-30 percent higher.

Apart from growing seedlings, peasants in China's north, northwest, and northeast also apply the agent directly to large stretches of land, which has the same effect in increasing the output of the crops.

These areas often suffer from low temperature, drought and frost in early spring, and it has been the usual practice for the peasants to cover their cropland with straw or animal dungs to raise the soil temperature.

Forestry is another field which has benefited from the use of this agent. In a forestry centre of the Inner Mongolia Autonomous Region, the survival rate of the saplings transplanted to the mountain areas is increased from 60 percent to 95 percent after a treatment of the soil around the roots with the diluted agent.

In a forest experimental station in northeast China, diluted agent is also applied on the scions of the grafted pine trees, which reduces the water evaporation of the scions and helps their healing with the stocks.

In some areas in north China, the agent is utilized to combat alkalinity. This is possible because, while reducing the water evaporation of the soil, the agent slows down the movement of the salt-containing water to the surface of the soil.

The temperature-raising agent was invented in 1970 by scientists of the Geophysical Research Institute of the Chinese Academy of Sciences in cooperation with the workers of the Dalian Fat and Oil Chemical Works in northeast China. In 1979, they were awarded by the State Scientific and Technological Commission with an invention prize.

The raw materials for producing the agent, mainly industrial residues of fat acid, fat alcohol, petroleum pitches and residues of edible oil, are available from nearby chemical works or village oil mills. The cost of the agent, therefore, is very low--some 0.2 yuan (U.S. $0.13) per kilo.

Up to the present, about a hundred small plants for producing this agent have been set up in the countryside.

For a speedy popularization of the temperature-raising agent in China's rural areas, scientists of the Geographical Research Institute have written a thesis entitled "Temperature-raising Agent for Soil and its Application in Agriculture and Forestry" and other articles. A color documentary film featuring the agent has been made by the Beijing Agricultural Film Studio.

CSO: 4020

FERTILITY OF BLACK SOIL AFTER RECLAMATION STUDIED

Beijing TURANG XUEBAO [ACTA PEDOLOGICA SINICA] in Chinese Vol 17 No 1, Feb 80 pp 20-32

[Article by Ding Ruixing [0002 3843 5281] and Liu Shutong [0491 2885 2717]$^{(1)}$ of the Northeast Agricultural College: "A Study of the Fertility of Black Soil After Reclamation"]

[Text] Black soil is widely distributed in the province of Heilongjiang. It constitues 45.2$^{(2)}$ percent of the area of arable land of the province. It is the major cultivated soil of the province and constitutes the major food grain producing region. In the construction of commercial food grain bases, it has important significance. Because black soil is fertile and easy to till, it has been given priority regarding development. After Liberation, large state-run farms were organized and set up in that region and mechanized planting and tilling was implemented. But over a long period in the past, tilling was unrefined and the productive ability was not stable enough. To reasonably utilize land, fully develop the potential fertility of black soil, achieve the goal of stable yields and increased yields, it is necessary to conduct studies of the patterns of change in the fertility of the soil after reclamation of black soil. In 1964 we conducted observational studies at a fixed locality in the Zhaoguang region, contrasted the characteristics of the fertility of the black soil of unclaimed land with those of tilled black soil over different number of years. The studies were conducted in the plots of land designated 96 and 97-1 and its neighboring wasteland adjacent to the second team of the Tongbei Farm of the original Zhaoguang Agricultural Reclamation Bureau.

The Zhaoguang region is located in the forest meadow steppe belt of the eastern part of the Song-Nen Plains. The topography is mostly 1- to 5-degree slopes and gradual uplands. The mother substance is loess clayish sediments. The underground water is 40 to 60 meters deep. The basic climatic characteristic is a long and severely cold winter. Summer is short and moderately hot. The annual average temperature is 0.4°C. The soil's frozen period lasts about 9 months. The frozen layer can reach a depth of between 2.4 and 2.7 meters. The annual amount of rainfall is about 600 millimeters, 80 percent of which is concentrated between June and

September. Annual amount of evaporation is about 1,000 millimeters. These factors directly affect the water and heat conditions of the black soil of the area. Because the soil texture is heavy and because of the presence of seasonal frozen layers of soil, water permeability of black soil is poor, water retention is strong and it can collect massive amounts of rainfall in summer and autumn so that the soil is in a damp state for a long period, suitable for the development of hygrophilous meadow plants. A peculiar process of becoming meadow land[1] different from the results of the effects of underground water is formed. The soil has accumulated massive amounts of organic matter. Thus a black soil with a deep and thick humus layer and of good aggregate structure is formed.[2-4]

After reclamation of wasteland, the state-run farm implemented mechanized cultivation and planted mainly wheat and soybeans. Miscellaneous cereals were very few. Frequently wheat was planted as continuous crops and soybeans were planted following soybeans. According to the surveys conducted by the Zhaoguang farm at the time,(3) the area of repeated crops of wheat constituted 38 to 48 percent of the area of sowing. The area of soybean crops reached 24 to 49 percent. This exhausted the soil fertility and the yield dropped. In particular, organic fertilizer was seldom used in that area and only a small amount of chemical fertilizer was applied and basically the soil's original fertility was utilized for production. With careless management of planting, relatively high yields could only be maintained for 7 to 8 years after reclamation and as time went on most of the soil's fertility dropped and the yield reduced.

I. Changes in the Morphological Characteristics of Cross Section of Black Soil After Reclamation

Meadow plants such as small leaf camphor, luo dou yang and garden burnet are mainly grown in the black soil of the wasteland in that region. The masses call it the "wu hua zao tang." The ground surface has a thin layer (about 1 centimeter) of semidecomposed remnants of grasses. The humus layer is about 50 centimeters thick. The color is dark gray. The soil is of aggregate structure. There are many root systems of plants. The soil is heavy loam with a light and loose texture. The transient layer (A/B) is 28 centimeters thick. The color is dark brownish gray. The soil is microaggregate in structure. There are roots of grasses. The soil is a rather tight and compact heavy loam. The sedimentary layer is dark brownish gray with a mixture of reddish brown spots. It is microaggregate in structure. The surface of the structure has a lot of SiO_2 powder, rust spots, light clay. The soil texture is tight and compact and there are very few plant roots. The entire layer of the soil does not react to lime but there are more iron microaggregates.

The changes in the morphological characteristics of the cross section of the soil after reclamation of black soil are mainly manifested by the following: 1. The thickness of the humus layer gradually decreases. At the beginning of reclamation, it was about 50 centimeters thick. From 10 to 17 years after reclamation, it dropped to 31 to 33 centimeters. In the year of reclamation, tilling is ceased. The layer of grassroots rapidly decomposes and uncultured soil becomes activated. 2. As the number of years of cultivation increases, the differentiation of the plowing layer becomes more obvious and a plow pan layer emerges. The thickness of the plow pan layer gradually increases. The structure develops from a flaky shape to a layer shape. Its compactness changes from loose to tight and the amount of roots lessens. 3. The structure of the soil of the plowing layer is gradually destroyed as the number of years of cultivation increases. At the beginning period of reclamation, the soil had a better aggregate structure. Later, it gradually changed from granules-granular to granule-lump shapes, powdery granule-lump structure. 4. The amount of roots in the subsoil layer gradually decreases and there is an accumulation of humus colloidal film.

II. Changes in the Content of Nutrients and Humus After Reclamation of Black Soil

After reclamation of black soil, the plant remnants in the soil rapidly rot and decompose. Conditions of accumulation of organic matter are destroyed, and the content of humus in the soil drops. This is most obvious during the beginning period of the plowing layer. As the number of years of cultivation extends, the content continues to drop. For example, if the content of humus in the soil layer between 0 and 12 centimeters of black soil in the wasteland is taken as 100, then the content of humus drops to 80.6 during the first year of cultivation, 77.1 after 7 years of cultivation, 62.3 after 10 years of cultivation, and 58.2 after 17 years of cultivation. In the first year after reclamation, the content of humus in that layer is reduced by about 20 percent so that the soil is activated. Cultivation from 10 to 17 years reduces the humus by 38 to 42 percent. But the various layers of soil underneath the plowing layer is not affected by plowing and turning of the soil much and the water and heat conditions are relatively stable. Therefore, decomposition of the humus of the soil is slow. A state of stable and gradual reduction is maintained. For example, the soil layer between 25 centimeters and 33 centimeters contained 5.36 percent of humus before reclamation. After cultivating the soil for 10 to 17 years, the humus content was still between 4.09 and 4.17 percent, less than that of the wasteland by 22 to 24 percent. It can thus be seen that in the black soil of the wasteland the vertical distribution of humus in the soil is redistributed by long periods of cultivation. In the wasteland, the humus mainly concentrates in the surface layer, and the speed of deepening is slowed. The content of humus in the soil gradually decreases from top to bottom after many years of cultivation. This phenomenon shows that on the one hand, the accumulation of organic matter in the soil of cultivated land and the method of decomposition are obviously different from the soil of the wasteland, and on the other hand it may be possibly related to the leaching and shifting process of the humus in the soil of the cultivated land.

Surveys of the amount of accumulation of organic matter in cultivated land and wasteland show that the portion of the natural plants on the wasteland above ground can reach 8.17 tons. The total amount of the underground portion from 0 to 80 centimeters deep can reach 42.64 tons/hectare. The weight of roots between 0 and 30 centimeters is 39.5 tons/hectare. The weight of roots between 30 centimeters and 50 centimeters is 2.61 tons/hectare. The weight of roots between 50 centimeters and 80 centimeters is 0.53 tons/hectare. It can be seen that the root system of natural plants is mainly concentrated in the surface layer at 30 centimeters. Because the natural vegetation is perennial herbs, besides the plants of the portion above ground that wither and die each year, there are also parts of the root system which die and remain in the soil. Measurements show the plant remnants remaining in the soil each year in the wasteland is 11.25 tons/hectare. But the portion (stems, stalks, seeds, solid parts) of the crops above ground planted in the cultivated land is harvested, taken away or burned at the locality each year. The roots and stubble remaining in the soil constitute only a small part. Measurements show the dry weight of organic matter of crops in cultivated land cultivated over different number of years may reach 9.12 to 10.14 tons/hectare Besides the stems and seeds, the roots and stubble remaining in the soil constitute only 1.93 tons/hectare of 4.01 tons/hectare, the accumulation of organic matter in the soil of wasteland far surpasses that in cultivated soil. And the organic remnants are mainly accumulated in the surface soil layer. This is the fundamental reason that the vertical distribution of the humus of the soil in the wasteland is different from that in the cultivated soil.

Leaching and shifting of the humus in the soil can be observed in the morphology of the cross section. It shows that a dark gray humus colloidal film is distributed on the surface of the structure of lower layers of the soil cultivated for many years. We further measured the content of water soluble humus in the soil and found that its pattern of change is similar to the change in the total amount of humus in the soil. Its vertical distribution in the soil reduces from top to bottom. As the number of years of cultivation increases, the content of water soluble humus in the soil gradually lessens (Table 1). But the ratio of water soluble humus and the total amount of humus increases from the surface layer to the lower layer. As the number of years of cultivation increases, the ratio tends to increase. Therefore, activities of human cultivation can increase the activeness of humus in the soil so that humus in the soil layer is redistributed.

After reclamation of black soil and as humus decreases, the total nitrogen content also changes according to a pattern (Table 2). As the number of years of cultivation increase, the total nitrogen content continues to lessen, and especially during the several years at the beginning after reclamation of the plowing layer, the reduction is more obvious. After long periods of cultivation or in the lower soil layers, the reduction in

Table 1. Content of Water-Soluble Humus and the Ratio of Water-Soluble Humus/Total Humus of Virgin and Cultivated Black Soils

深度 (cm) Soil depth	荒地 Virgin land	耕种年限 Years of cultivation			
		1	7	10	17
0—12	$\frac{0.24}{0.021}$	$\frac{0.18}{0.019}$	$\frac{0.18}{0.020}$	$\frac{0.17}{0.024}$	$\frac{0.16}{0.024}$
12—22	$\frac{0.19}{0.021}$	$\frac{0.20}{0.023}$	$\frac{0.14}{0.025}$	$\frac{0.14}{0.026}$	$\frac{0.13}{0.025}$
25—35	$\frac{0.13}{0.028}$	$\frac{0.11}{0.020}$	$\frac{0.08}{0.019}$	$\frac{0.08}{0.020}$	$\frac{0.08}{0.019}$
40—50	$\frac{0.10}{0.026}$	$\frac{0.07}{0.021}$	$\frac{0.07}{0.031}$	$\frac{0.06}{0.031}$	$\frac{0.04}{0.021}$

Note: 1. Water-soluble humus in soil was determined by Tulin method.[17]
2. Numerator is Content of water-soluble humus (percent), Denominator is Content of water-soluble humus/Total humus.

Table 2. Variation of Total N in Black Soil in Relation to Years of Cultivation *

深度 (cm) Soil depth	荒地 Virgin land	耕种年限 Years of cultivation			
		1	7	10	17
0—12	0.30	0.48	0.45	0.43	0.43
12—22	0.42	0.44	0.37	0.36	0.36
25—35	0.34	0.36	0.31	0.29	0.27
40—50	0.25	0.22	0.16	0.14	0.14
60—70	0.14	0.12	0.12	0.11	0.12
70—80	0.12	0.11	0.11	0.11	0.11

Note: *Total N was determined by Kjeldahl's method.

nitrogen is relatively stable. In addition, even though the soil of the wasteland and soil that has been newly reclaimed contain a lot of humus, the content of nitrogen in the humus is relatively low and the C/N ratio is relatively large. The longer the period of cultivation, the smaller the C/N ratio of the soil. For example, in the soil layer between 0 and 22 centimeters, the C/N ratio of the soil of the wasteland is between 11.4 and 13.4, the ratio of the soil 1 year after reclamation is between 11.2 and 11.3, in the soil 7 years after reclamation it is between 8.9 and 11.5, in the soil cultivated for 10 years it is between 8.8 and 9.7, and in the soil cultivated for 17 years it is between 7.1 and 9.1. Therefore in the process of long periods of cultivation, the amount of humus in the soil decreases but the nitrogen content in the humus rises correspondingly. This phenomenon has an important significance to the relative stability of the fertility of the soil.

Table 3. Effect of Reclamation on the Hydrolyzed N in Black Soil*

土層 (cm) Soil depth	水解氮含量(毫克/100克土) Hydrolyzable nitrogen (mg/100g soil)					水解氮占全氮的% % Hydrolyzable-N in total-N				
	荒地 Virgin land	耕种年限 Years of cultivation				荒地 Virgin land	耕种年限 Years of cultivation			
		1	7	10	17		1	7	10	17
0－12	15.2	13.1	12.1	10.7	10.3	3.0	2.7	2.7	2.5	2.4
12－22	12.9	13.0	11.5	10.0	9.7	3.1	3.0	3.1	2.8	2.7
25－33	11.6	10.3	8.6	7.4	7.8	3.4	2.9	2.8	2.6	2.9
40－50	9.0	7.4	7.5	7.0	6.3	3.6	3.4	4.7	5.0	4.5

* Hydrolyzed N was determined by Tulin and Konnova's method.

Table 3 shows that whether in the wasteland or in cultivated soil, the content of water soluble nitrogen and its pattern of change are all similar to the change of the total content of nitrogen. During the beginning period of reclamation (1 to 7 years), the water soluble nitrogen is relatively stable. This may be related to the process of maturation of the soil. At the same time, water soluble nitrogen tends to concentrate at the lower layers. Therefore, even though beans and wheat are planted in rotation in the black soil of the Zhaoguang area, if organic fertilizers and nitrogenous chemical fertilizers are not applied, the consumption of nitrogen in the soil caused by the cultivation of crops is not only manifested by a reduction of the content of total nitrogen but is also reflected in the continual loss of effective nitrogen. Therefore in the cultivation process, especially in the black soil cultivated for many years, supplementing nitrogenous nutrients is a necessary measure to maintain a stable nutritional condition. Porter[11] pointed out that after reclamation of wasteland, not only does the content of total nitrogen decrease, the nitrogen of each group in an organic state also decreases, and among them, the loss of undistilled acid soluble nitrogen (amino acids) is the greatest, while the loss of acid insoluble nitrogen (humin) is the least. Similar results can be seen in the ordinary chernozem of the Kamen steppe.[14]

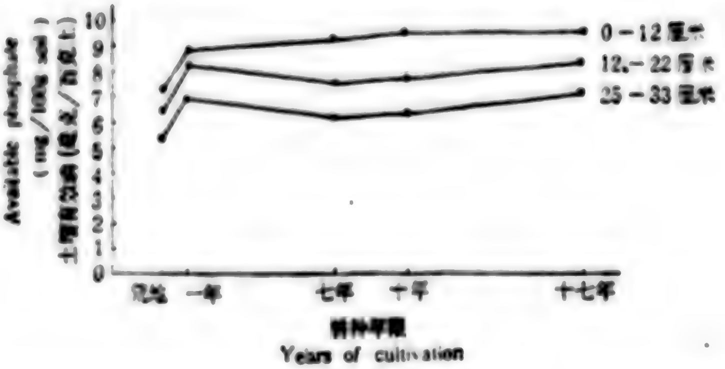

Figure 1. Changes of available phosphate in black soils after reclamation

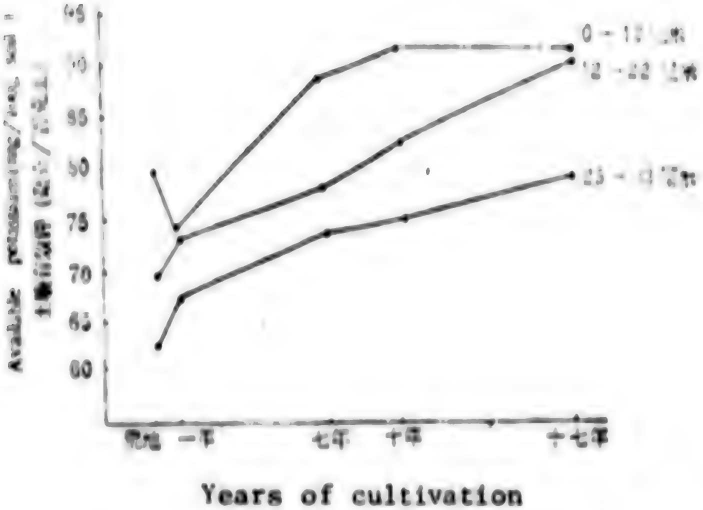

Figure 2. Changes of available potassium in black soil after reclamation

It can be seen from Figures 1 and 2 that the content of effective phosphorus and potassium[13] in the cultivated soil is higher than that in the uncultivated soil. In the first year after reclamation, some effective phosphorus rapidly increases. As the time of cultivation lengthens, the amount of effective potassium and the effective phosphorus of the surface layer also increases. In the Zhaoguang area wheat is planted in large areas. After harvests by machine, the stems are burned in the fields to facilitate turning over the soil. Although a fair amount of effective potassium and some mineral nutrients are left in the soil, and this is beneficial to the supply of potassium in the soil of cultivated land, but from the point of view of improving the material cycle in the soil of cultivated land, this measure is not economic and reasonable. We believe when wheat fields are turned over, and if wheat straws are cut up, plowed under and compacted into the fields, then all of the nutritive substances of the soil can be increased and organic matter can be supplemented in massive amounts, and the goal of increasing fertility and nourishing the land can be realized.

III. Changes in the Microaggregates and Structural Properties of the Soil After Reclamation of Black Soil

It can be seen from Table 4 that the amount of aquatically stable aggregate structure larger than 0.25 millimeters in the surface layer (0 to 12 centimeters) of the black soil of wasteland can reach 88 and 66 percent in the layer between 12 and 22 centimeters. After black soil has been reclaimed, the amount of aquatically stable aggregate structures rapidly decreases, especially visible in the surface soil layer. If the amount of aquatically stable structures larger than 1 millimeter in the soil

Table 4. Variation of Water Stable Aggregate After Reclamation of Black Soil*

[illegible] Soil condition	[illegible](cm) Soil depth	[illegible](%) 粒径: mm Structure of waterstable aggregate								>0.25 <0.25	[illegible](%)** Ratio of aggregate fracture
		>3	3–2	2–1	1–0.5	0.5–0.25	>1	>0.25	<0.25		
荒地 Virgin land	0–12	35.2	5.2	11.1	26.0	8.4	51.5	87.9	11.1	7.91	7.6
	12–22	6.8	3.2	6.5	38.6	10.7	16.5	65.8	31.1	1.98	21.3
	25–33	1.2	0.7	1.4	19.3	21.5	3.3	44.1	54.2	0.81	55.1
一年 1 year	0–12	9.4	1.2	4.2	30.3	12.3	14.8	57.4	41.1	1.40	32.0
	12–22	9.4	1.7	7.4	40.4	10.9	18.5	69.8	28.3	2.47	22.9
	25–33	3.7	2.1	6.2	34.1	12.1	12.0	58.2	40.3	1.44	34.5
七年 7 years	0–12	5.0	1.0	2.7	21.9	17.5	8.7	48.1	51.1	0.94	41.3
	12–22	2.3	0.6	2.5	32.8	17.3	5.3	55.5	43.5	1.27	42.6
	25–33	0.6	0.3	1.9	30.9	23.4	2.8	57.1	40.7	1.40	41.5
十年 10 years	0–12	2.2	0.5	2.5	29.5	13.1	5.2	47.8	50.7	0.94	45.0
	12–22	2.2	0.6	3.3	28.9	14.4	6.1	49.4	49.3	1.00	46.0
	25–33	0.9	0.8	5.9	34.3	12.5	7.6	54.4	43.4	1.25	40.6
十七年 17 years	0–12	2.6	0.6	2.3	24.2	12.9	5.5	42.6	56.1	0.76	46.5
	12–22	4.5	1.4	4.4	26.6	13.6	10.3	50.5	48.4	1.04	43.3
	25–33	1.3	0.6	2.6	30.3	14.2	4.5	49.0	49.8	0.99	44.3

* 用萨维诺夫法测定。Determined by Savinov's method.

** $$\text{结构破坏率}(\%) = \frac{\text{干筛} > 0.25\ \text{毫米团聚体} - \text{湿筛} > 0.25\ \text{毫米团聚体}}{\text{干筛} > 0.25\ \text{毫米团聚体}} \times 100$$

$$\text{Ratio of aggregate frature} = \frac{\text{aggregate by dry sieving} > 0.25\text{mm} - \text{aggregate by wet sieving} > 0.25\text{mm}}{\text{aggregate by dry sieving} > 0.25\text{mm}}$$

layer of uncultivated land between 0 to 12 centimeter deep is 51.5 percent, the amount drops to 14.8 percent the first year after reclamation. As the number of years of cultivation extends, the percentage of destruction of the soil structure increases. The aquatically stable aggregate structures larger than 0.25 millimeters gradually decrease in a pattern. It can be seen that cultivation activity destroys the structural bodies larger than 1 millimeter first. This is because of mechanical damage and decomposition of organic matter in the soil so that the aggregation of the soil is destroyed.

To further explain the affects of activities of cultivation upon aggregation of soil structure, we used the Tulin method[15] to determine the change in the microaggregates of soil. Table 5 shows the effect of reclamation and cultivation upon microaggregates is not only manifested quantitatively, but their effect upon the composition of the microaggregates in the soil is also very great. After the wasteland is reclaimed, and as the number of years of cultivation increases, the amount of G_1 fraction of microaggregates gradually decreases, while the amount of G_2 fraction of microaggregates

Table 5. Effect of Years of Cultivation on the Amount of Microaggregate in Black Soil

土壤利用状况 Soil condition		土层 (cm) Soil depth	微团聚体含量(%) microaggregate			$\frac{G_1}{G_2}$
			G_1	G_2	$G_1 + G_2$	
荒地 Virgin land		0—22	54.7	16.6	71.3	3.3
		25—33	51.8	18.1	69.9	2.9
		40—50	49.9	17.5	67.4	2.8
耕种年限 Years of cultivation	1	0—22	54.5	16.0	70.5	3.4
		25—33	54.0	16.2	70.2	3.3
		40—50	49.4	18.3	67.7	2.7
	7	0—22	52.6	17.4	70.0	3.0
		25—33	50.5	20.0	68.5	2.8
		40—50	48.9	19.0	67.9	2.6
	10	0—22	51.7	18.3	70.0	2.8
		25—33	49.2	19.2	68.4	2.6
		40—50	47.3	19.9	67.2	2.4
	17	0—22	50.2	19.2	69.4	2.6
		25—33	46.5	20.7	67.2	2.3
		40—50	44.2	21.3	65.5	2.1

increases to different degrees. But the total amount of the two fractions of microaggregates still continues to decrease as the number of years of cultivation increases. This type of change indicates that the activity of cultivation creates favorable conditions for the decomposition and conversion of organic matter in the soil. Reduction of the humus in the soil will definitely cause partial decomposition of the organic and inorganic colloids in the soil, leading to differentiation of microaggregates. First the amount of G_1 fraction microaggregates of relatively strong activity and relatively poor stability decreases. This is not only manifested in the plowing layer but also exists in deeper soil layers. It is worth noting that the longer the time of cultivation, the more it is possible that the G_1 fraction of microaggregates in the soil will convert to G_2 fraction microaggregates. This type of situation may be related to the change in the conditions of water and heat. Cultivation of the soil loosens the soil layers, aeration is good, oxidation intensifies, and the active iron in the reduced state produced under damp conditions of the soil of the upper layers shifts and oxidizes, thus the colloids in the soil solidified and knotted. Cultivation promotes aging of compounds of colloids of the soil, and the G_2 fraction of microaggregates in the cultivated soil gradually accumulates. Many researchers[5,6,15] have discovered at different areas the formation of G_2 fraction microaggregates under appropriate aerate condition in the soil.

The G_1 content of the G_1 and the G_2 fractions in the soil show that whether in wasteland or in cultivated land, the organic or inorganic colloids aggregated by calcium in the soil are dominant. The number of the G_1 fractions is two to three times the number of G_2 groups. Therefore the ratio of G_1/G_2 is larger than 1. As the number of years of cultivation increases, the ratio of G_1/G_2 gradually lessens. This indicates that in the process of continuous agricultural cultivation and planting, the changes of the microaggregates in the soil is unfavorable to the formation of the soil structure. When the number of G_2 fractions increase, the ratio of G_1/G_2 continuously lessens, and correspondingly the destruction process of the soil structure continues. Therefore, analysis of the total amount of microaggregates in the soil and the ratio (G_1/G_2) of the two fractions of microaggregates can better reflect the inner mechanism of the good and the bad structural properties of black soil. Xiong Yi et al[7] pointed out from the point of view of the micromorphology of the soil structure that black soil contains more organic matter, the aggregation is loose and does not easily break up. Its microaggregates are mostly arranged in rings or in layers. The level of fertility of the aggregates loosely combined and arranged in rings is higher than that of aggregates of trioxides and dioxides tightly combined and arranged in layers.

The composition of the humus of the black soil of the wasteland of the Zhaoguang area is mostly humic acid.[8] This type of humic acid combines mainly with calcium, and the part that combined with trioxides and dioxides and humin are less, therefore the soil structure is good and scattering characteristics are poor. The aquatically stable aggregate structures >0.25 millimeters in the surface layer of black soil of the wasteland can reach 88 percent. In the first year after reclamation, this drops to between 57 and 70 percent. During the later process of cultivation, the aquatically stable structures gradually decrease. But the content of the G_1 fraction of aggregates in the wasteland and in the cultivated land 1 year after cultivation is relatively similar. This indicates the aggregates on the surface layer of wasteland are mainly compounds of organic colloids and inorganic colloids that were newly formed so that the soil granules stick together. The root systems of the plants also solidify the soil and form larger aggregates. When cultivated, the remnant roots of plants and humus rapidly decomposes. The soil structure is greatly destroyed. Therefore the biochemical stability of the aggregates of the soil in the wasteland is poorer.

Analysis of the two groups of microaggregate humus and the amount of total nitrogen (Table 6) shows that humus and nitrogenous nutrients are concentrated en masse in microaggregates <0.01 millimeters. The content of humus in the G_2 fraction of microaggregates far surpasses that in the G_1 fraction. In wasteland, the content of the former is onefold more than the latter. Therefore humus tends to concentrate in the G_2 fraction. As black soil is reclaimed and continually cultivated, the humus and the content of total nitrogen in the two fractions of aggregates in the soil gradually decrease.

Table 6. Variation of Amount of Humus and Total N in Microaggregate of Black Soil

土壤利用状况 Soil condition		深度 (cm) Soil depth	G₁ 组 fraction			G₁ 组 fraction		
			腐殖质(%) Humus	全氮(%) Total-N	$\frac{C}{N}$	腐殖质(%) Humus	全氮(%) Total-N	$\frac{C}{N}$
荒地 Virgin land		0—22	11.77	0.66	10.4	22.86	0.96	13.8
		25—33	7.76	0.45	10.0	14.09	0.62	13.2
		40—50	5.71	0.36	9.2	10.41	0.44	13.7
耕种年限 years of cultivation	1	0—22	10.64	0.59	10.6	18.08	0.86	12.2
		25—33	9.49	0.56	9.8	16.63	0.71	13.6
		40—50	4.69	0.31	8.8	8.93	0.39	13.3
	7	0—22	9.42	0.58	9.4	15.69	0.74	12.3
		25—33	7.04	0.43	9.5	9.26	0.50	10.7
		40—50	4.48	0.29	9.0	5.52	0.32	10.0
	10	0—22	8.87	0.55	9.4	15.58	0.73	12.4
		25—33	6.47	0.42	8.9	7.17	0.42	9.9
		40—50	3.75	0.27	8.1	5.41	0.31	10.1
	17	0—22	8.55	0.53	9.4	14.70	0.72	11.8
		25—33	5.42	0.39	8.1	6.55	0.41	9.3
		40—50	3.64	0.26	8.1	3.96	0.26	8.8

The D/N ratio correspondingly lessens. This indicates when the soil structure deteriorates, the nutritive condition also deteriorates. This further proves the potential fertility of black soil drops as it is cultivated. Therefore, the change in the number of microaggregates in the soil and the quality are an important indicator that reflects change in the soil's fertility.

IV. The Effect of Long Periods of Cultivation Upon the Physical Properties of Soil

The texture of black soil is generally heavy loam and light clay (Table 7). Because of leaching during the process of formation of the soil, physical clay granules shift to the bottom layers and the deeper the layer the more physical clay granules. The texture of the upper layers is generally heavy loam and that of the bottom layers is light clay. The mechanical composition of the cultivated black soil does not appear to have differentiated or changed visibly. Figure 3 shows that the specific gravity, unit weight of black soil increase step by step from the top layers. This is clearly related to the content of organic matter in the soil. As the number of years of cultivation increases, the specific gravity and unit weight of the soil in the plowing layer also gradually increase. The change in the porosity of the soil (Figure 3) shows that it surpasses 50 percent in the upper layer (between 0 and 30 centimeters) of black soil and reaches above

Table 7. Content of Physical Clay and Texture Distribution in Profile of Virgin and Cultivated Black Soils*

深度 (cm) soil depth	物理性粘粒(<0.01mm)含量(%) Physical clay percentage					土壤质地层次 Soil texture horizons				
	荒地 Virgin land	一年 1 year	七年 7 years	十年 10 years	十七年 17 years	荒地 Virgin land	一年 1 year	七年 7 years	十年 10 years	十七年 17 years
0–12	54.3	53.3	57.8	57.9	52.7	重壤土 Heavy loam	重壤土 Heavy loam	重壤土 Heavy loam	重壤土 Heavy loam	重壤土 Heavy loam
25–33	57.6	56.2	57.0	58.7	56.1					
40–50	61.0	54.8	61.1	59.8	61.0	轻粘土 Light clay	重壤土 Ditto	轻粘土 Light clay	重壤土 Ditto	轻粘土 Light clay
80–90	64.6	63.3	62.3	67.1	65.9		轻粘土 Light clay		轻粘土 Light clay	

* 机械分析用吸管法
Pipette method was used in mechanical analysis.

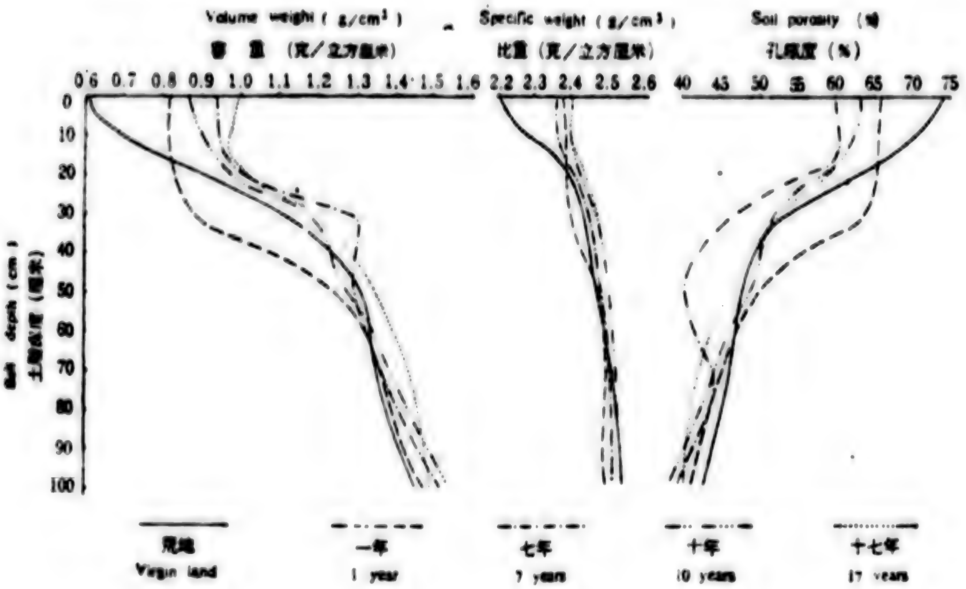

Figure 3. Changes of specific gravity and volume weight and porosity in black soils after reclamation

60 percent in the surface layer. In wasteland it reached between 66 and 72 percent. The change in the porosity of the soil after black soil has been reclaimed is very visible. The scale of change in porosity of the soil of different years of cultivation is greater in the upper soil layers and smaller in the bottom layers.

The change in the physical nature described above is closely related to planting and cultivation and such agricultural measures. Under the same methods of planting and cultivation (such as barley fields cultivated for

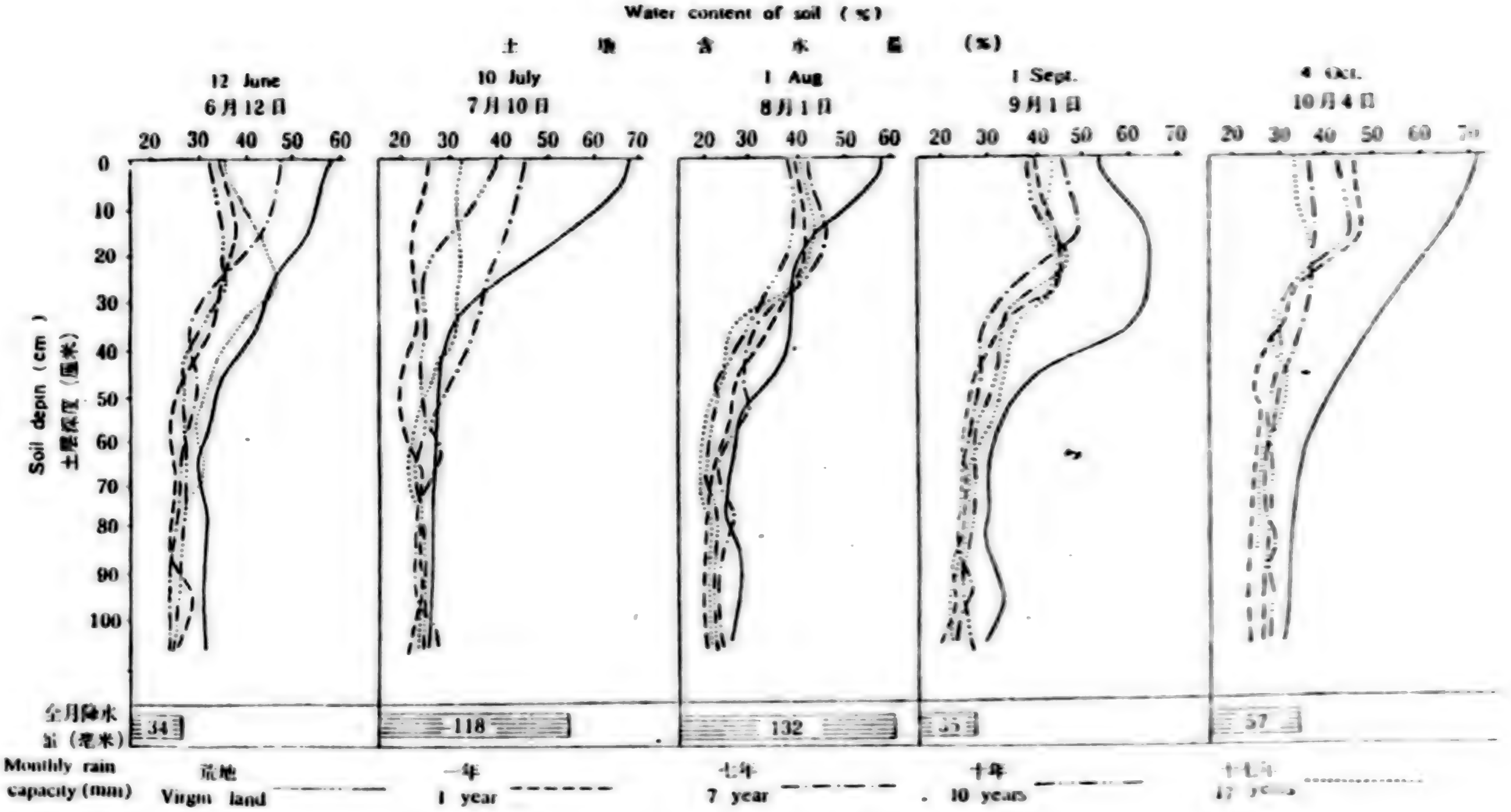

图 4 荒地及耕地黑土水分的动态变化

Fig. 4 The dynamic variation of water in vir[illegible]nd cultivated black soils

1 year, 10 years, and 17 years), the unit weight of the soil of the plowing layer increases as the number of years of cultivation increases while the porosity gradually reduces. The unit weight of the soil of the plowing layer of black soil cultivated for more than 10 years in that area is maintained at below 1 gram/centimeter^3, the porosity is still about 60 percent, and undoubtedly this type of loose soil situation is more beneficial to crop growth. Lan Shizhen [5663 1102 3781] believes that when the unit weight of cultivated black soil increases to 0.8 to 0.9, the overly loose condition of the soil layer changes and wheat grows well. But in the process of long periods of cultivation, deterioration of the physical conditions due to frequent tilling and the lack of the use of organic fertilizers must be taken into consideration. Han Fengchun [7281 6646 2504] et al(4) pointed out in their studies that when the unit weight is larger than 1 gram/centimeter^3, and when the porosity is below 55 percent, black soil becomes hardpan and gelate.

V. Changes in the Water and Heat After Reclamation of Black Soil

(1) Changes in the Activity of Moisture After Reclamation of Black Soil

Moisture is the most active factor of soil fertility. Because the underground water level is deep in black soil, the source of moisture mainly depends upon atmospheric rainfall. Therefore the change in the activity of moisture in the soil is affected by weather conditions, vegetation on the ground surface, condition of tilling and soil properties. Observation (Figure 4) shows that there is a visible difference between the wasteland and the cultivated land. The wasteland is covered by natural vegetation. The ground surface is covered with a thin layer of plant remnants. The soil's structure is good, it easily accepts atmospheric rainfall and these suppress ground surface evaporation. Therefore the content of moisture in the soil of the wasteland between 0 and 100 centimeters generally surpasses that of cultivated soil. In particular, the moisture of wasteland in the soil layer of the top 50 to 60 centimeters is much higher than that of cultivated soil. During the relatively arid middle 10 days of June, the moisture in the wasteland in the soil layer between 0 and 20 centimeters is 52.5 percent, the cultivated land is 32.5 to 44.2 percent. In July when rain is more frequent, the moisture in that layer of soil in the wasteland increases to 59.3 percent (average value), while that of the cultivated land drops to between 21 and 42 percent. But the content of moisture in the lower layers of the soil in both the wasteland and the cultivated is close and the range of change is small. For example, the water content of the wasteland in the soil layer between 60 and 100 centimeters in June is between 30 and 31.3 percent. It is between 23.3 and 30.3 percent in the cultivated land. In July, the water content in the wasteland remains at 25.7 percent and that in the cultivated land also basically remains at between 22.8 and 24.4 percent.

The water supply in the cultivated land and the wasteland (Figure 5) shows the water supply in the wasteland is always more ample throughout the

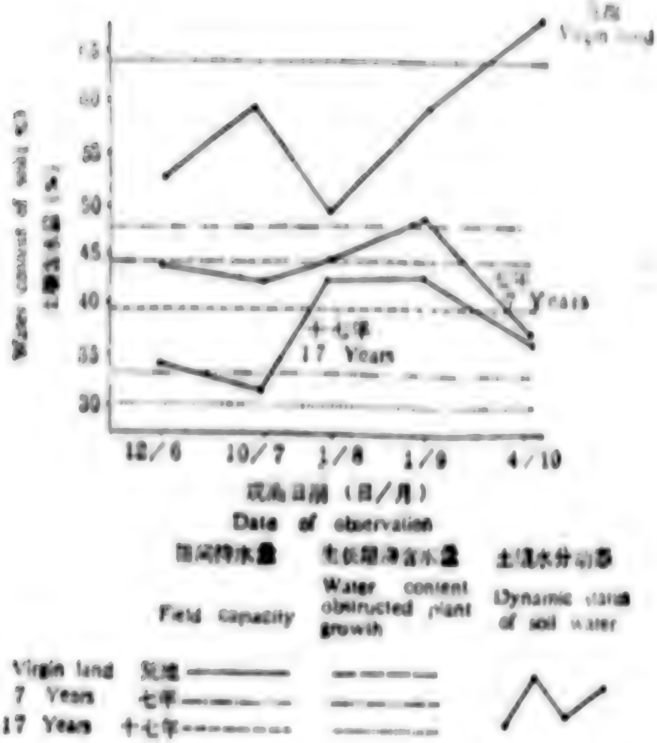

Figure 5. The dynamic variation of water supply in virgin and cultivated soils (0-20 cm)

entire growth period of plants. It surpasses the water content that hinders growth (water content that breaks capillaries) and sometimes surpasses the amount of water retained by the fields. The water supply during the peak period of growth (June to July) of crops planted in wheat fields of level cultivation cultivated for 17 years is insufficient, close to the water content that hinders growth. After harvesting wheat in August and September, it visibly increases and surpasses the amount of retention of the fields. The water content of the soil of ridged fields planted with soybeans (cultivated 7 years) always remains at a relatively high level, far surpassing the water content that hinders growth and approaches the amount of retention of the field. Thus the question concerning the supply of water when cultivating crops in black soil regions is concerned with an easy lack of water in wheat fields during the early period and overly damp soil during the latter period of growth, affecting mechanical harvesting. Water supply in soybean fields is good. This is definitely related to ridged cultivation which creates favorable moisture conditions.

(2) Change in Temperature After Reclamation of Black Soil

Temperature of the black soil in the wasteland is lower than that of the cultivated land whether at the ground surface or at 20 centimeters deep.

The averages measured month by month from June to October show that the ground surface temperature of the wasteland is 13.6°C, that of fields cultivated for a year is 19.7°C, that of fields cultivated for 7 years is 19.1°C, that of fields cultivated for 10 years is 19.7°C, that of fields cultivated for 17 years is 19.8°C. At a depth of 20 centimeters, the ground temperature in the wasteland is 12.2°C, in the land cultivated for 1 year it is 14.9°C, in the land cultivated for 7 years it is 14.7°C, in the land cultivated for 10 years it is 15.5°C, and in the land cultivated for 17 years it is 15.7°C. The difference in ground temperatures in fields cultivated for different number of years is not great.

It can be preliminarily seen from the observed data on moisture and ground temperature of black soil in cultivated fields and wasteland that the moisture content of the black soil in the wasteland is generally higher than that in cultivated land, and the ground temperature is lower than that of cultivated land. Reclamation changes this "damp and cool" state, benefits activity of microorganisms in the soil, stimulates decomposition of organic matter and conversion of nutrients, creates a good environment for crop growth. But in the process of long periods of cultivation, the storage of organic matter and nutrients in the soil continues to lessen, the potential fertility is gradually exhausted, and the imbalance of the factors of fertility exerts a corresponding effect upon the growth and yield of crops. The yield of barley in the second year after reclamation of black soil (cultivated 1 year) is 2.61 tons/hectare, 2.42 tons/hectare in fields cultivated for 10 years, 1.99 tons/hectare in fields cultivated for 17 years. Therefore, when depending on the natural fertility of black soil, the yield of crops is relatively high during the first 10 years as the soil matures. Seventeen years after reclamation, the yield drops more obviously. Therefore under conditions of cultivation for long periods, the water and heat conditions of the soil must be adjusted and the potential fertility of the soil must be fully developed and at the same time attention must be paid to bank fertility of the soil and raise the effective fertility of the soil.

VI. The Evolutionary Process of Fertility of Black Soil After Reclamation

In summary, after reclamation of black soil, the various factors of fertility of the soil undergo visible change under mechanized planting and implementation of farming systems. The process of change in fertility of black soil can be divided into three stages:

(1) Activation stage. One to 2 years after reclamation, the soil of the plowing layer is aerate, water permeability is improved, ground temperature rises, activity of microorganisms is intensified, the grass roots layer rapidly rots, organic matter decomposes fast, effective nutrients are easily released, large aggregates become smaller, unit weight of the soil increases, porosity reduces, the soil's potential fertility converts to effective fertility and uncultivated soil begins to become active. But because the soil's retention of water is strong, the soil remains cold and pasty, and the growth and normal maturation of crops are affected. Soybeans

should be planted as the vanguard crop to raise the ground temperature. Wheat can be planted to increase consumption of water in the soil. The fields should then be tilled and dried and upturned to stimulate maturation of the soil.

(2) Maturation stage. This lasts from 7 to 10 years. The organic matter in the soil further decomposes. Nutrients gradually become effective. The various nutrients can basically supply the needs of the crops. Nitrogen and potassium are especially sufficient. Although the aggregate structure is destroyed somewhat, the soil's unit weight and porosity further improve. The degree of looseness of the soil is appropriate, the moisture is sufficient, the ground temperature rises slightly, the various factors of fertility are more in coordination, the effective fertility of the soil is raised and is in a relatively stable state. This is the period of high yields of crops. Under a rotation cropping system of beans and wheat, a definite level of fertility can be maintained. But additional application of phosphorous fertilizers or nitrogen and phosphorous chemical fertilizers can further elevate the yield. Implementation of tilling and turning up the soil, deep loosening of the soil and raking the stubble in combination can develop and effectively utilize the potential fertility of the soil. Attention must be paid to the retention of water and soil on cultivated slope land.

(3) The stage of banking fertility. After 10 years of cultivation, spending of the soil's fertility is greater. The stored organic matter and nutrients visibly decrease. The soil structure is massively destroyed. The effective fertility lessens. If the simple utilization of the potential fertility of the soil is continued, the demands of growth of the crops cannot be satisfied. Attention must be paid to banking fertility of the soil, reasonable planting and tilling and combined utilization and nurturing of the soil to prevent the soil from gelating and becoming hardpan.

To retain a stable and continued high yield of black soil, reformation of the tilling and planting system, rotation cropping system and fertilization system must be implemented from the maturation stage and leakage and loss of water and soil must be prevented.

(1) In tilling, the method of continued tilling and upturning of the soil year after year must be changed. A method of upturning the soil in summer and autumn must be established as a basis for forming an alternating system of plowing upturning, raking and loosening combined with raking of the stubbles and deep loosening to prevent overly frequent plowing and avoid low quality of plowing, destruction of aggregate structures and rapid decline of the soil's fertility. Practice shows this makes it possible to alternate level planting and ridged planting and a combination of plowing and upturning at the top and loosening of the deep layers of the soil. The soil can thus be upturned at the top and loosened at the

bottom. The plowing layer can be deepened. The plow pan layer can be broken. Looseness and tightness of the plowing layer are combined. The porosity of the soil can be combined. This benefits retention of water, retention of fertility, increasing the temperatures and destruction of weeds and also helps the appropriate decomposition and conversion of organic matter and nutrients in the soil, enlarge the scope of absorption of water and fertilizers by the root system of the crops, prevent lodging in the latter growth period and makes it possible to more reasonably and effectively utilize the potential fertility of the soil.[10]

(2) To combine utilization and nurturing of the fields, the system of rotation cropping of wheat, wheat and beans must be changed to avoid double cropping of wheat and double cropping and face-to-face cropping of beans. Wheat, soybeans and miscellaneous grains must be appropriately arranged, and a certain proportion of green manure crops must be planted. According to experiments conducted at that locality,(5) the results of rotation cropping of wheat, soybeans and miscellaneous crops in three areas and the rotation cropping of wheat, soybeans, wheat and miscellaneous crops in four areas are good. Turning and compacting green manure produce a more visible increase in yield. The Zhaoguang Farm testing station turned under and compacted green manure of vegetation and produced an average increase of 21 percent in yield of wheat and beans in 3 years.

(3) Organic fertilizers should be increased. At present, many state-run farms are managed relatively simply. Agriculture is the main work. There is little animal waste as fertilizers. The source of fertilizers must be expanded and the level of application of fertilizers must be raised. If the return of straw and stems to the fields is the region's effective measure to bank fertility of the soil, the planting of cereals must be coupled simultaneously with the application of nitrogenous and phosphorous chemical fertilizers.

(4) Pay attention to retention of water and soil. On cultivated slope lands, different degrees of leakage and loss of water and soil occur. According to the survey conducted by the Zhaoguang Farm,(6) that area's cultivated land on slopes of 2 degrees or more loses an average of 0.8 centimeters of surface soil each year, equivalent to a loss of 5.3 cubic meters of surface soil per mu. This is another reason for the drop in fertility of black soil in cultivated land. Thus, planting at equal height must be implemented on cultivated slopes and ridges that run along the slope must be changed to ridges that run across the slope to reduce run-off of the ground surface. Forest belts must be planted to prevent wind erosion in spring.

FOOTNOTES

(1) Now working in the Science Research Institute of the Nancha Forestry Bureau of Heilongjiang Province.

(2) Compiled by the Heilongjiang Provincial Agricultural Department; The Soil of Heilongjiang, 1962.

(3) Summary Information of the Production of Zhaoguang Farm, 1959-1961.

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(6) Survey Report on the Leakage and Loss of Water and Soil of Zhaoguang Farm and the Effects of Prevention, 1976 (Information).

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9296
CSO: 8111/1519

BRIEFS

URBAN GARDENING, AFFORESTATION--In the course of eliminating chaos and restoring order since the smashing of the "gang of four," Anhui has made good progress in urban gardening and afforestation. According to statistics, green areas in Anhui's 11 cities total 37.31 million hectares, averaging 9.7 square meters per person. About 13.4 percent of the urban areas are covered with trees. The Provincial CCP Committee attached great importance to urban gardening and afforestation and has issued instructions on improving their planning. Recently Comrade Zhang Jingfu, first secretary of the Provincial CCP Committee, stated: All public institutions, schools and factories should plant trees, flowers and grass next year. We should vigorously carry out this work next year, a work which will benefit us as well as our future generations. The Provincial Construction Commission recently held a forum of various municipal gardening departments in Hefei to draw up a plan for next year's large-scale afforestation drive in urban areas. The forum also decided to conduct a provincial-wide survey on flowers, trees and extraordinary natural scenery and to do a good job in the nursing of young plants, the technical training of a gardening contingent, scientific research, the introduction of famous and extraordinary plants and the planting of all kinds of flowers. [Excerpts] [OW231429 Hefei Anhui Provincial Service in Mandarin 1100 GMT 22 Aug 80]

RICE PRODUCTION--On 8 August, Lujiang county in Anhui completed crash harvesting of 710,000 mu of early rice and rush-planting of 696,000 mu of double-crop late rice. The county has 2,231 tractors of all kinds and 11,358 harvesters. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 10 Aug 80 OW]

RICE HARVEST--Shucheng county in Anhui has rush harvested most of its 468,000 mu of early rice crop in 15 days. It is expected that the county will be able to complete planting of 480,000 mu of double-crop late rice by 10 August despite the adverse affects of monsoon season. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 10 Aug 80 OW]

LIVESTOCK--Fuyang Prefecture, Anhui, has achieved good results in raising livestock. It now has 977,000 draught animals, 800,000 hogs, 1.28 million sheep, 1.62 million rabbits and a great number of domestic foul. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 11 Aug 80 OW]

GOAT-RAISING--Huoqiu county in Anhui has made headway in goat-raising enterprise this year. As of the end of June, the county raised 214,000 goats, topping the corresponding 1979 period by 45 percent. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 12 Aug 80 OW]

ECONOMY--Taihe county in Anhui has 1.88 million mu of arable land, of which 30 percent can be used for planting cash crops. The county has 453,000 able-bodied farm workers, and part of this labor force can be used to develop a diversified economy. This year, the county has reaped more than 3 million jin of rapeseed from 30,000 mu. It has completed planting of sesame, peanuts and cotton on 92,000 mu, 39,000 mu and 183,000 mu respectively. The county's number of big livestock and live pigs stood at 70,900 and 223,700 head respectively in the first half of this year. [Hefei Anhui Provincial Service in Mandarin 1100 GMT 16 Aug 80 OW]

CSO: 4007

FUJIAN

BRIEFS

TYPHOON HITS FUJIAN COUNTY--The Central Meteorological Observatory issued a typhoon report at 1000 GMT on 28 August. Typhoon No 12 of this year hit Pingtan county, Fujian, at 0500 GMT on 28 August with maximum winds of grade 10 near the center. It is predicted that the center of the typhoon will move slowly in a northwesterly direction with a reduced force. It is expected to turn into a low pressure by tonight. Under the influence of the typhoon, from tonight till tomorrow, gales of grade 6-9 will be experienced in the East Sea, the Taiwan Strait and coastal areas in southern Zhejiang and in Fujian Province. Heavy and torrential rains will fall in southern Zhejiang, Fujian, central-south Jiangxi and eastern Guangdong. All units concerned are requested to tune in to weather forecasts by local weather stations. [Text] [OW281617 Beijing Domestic Service in Mandarin 1200 GMT 28 Aug 80]

SUGAR CANE--Fuzhou, 10 Aug--Thanks to dissemination of the results of agricultural science and techniques, the cane sugar output and grain output of Xianyou County, Fujian, have markedly increased over the past 3 years. Last year, the county's per-mou yield of sugar cane and grain reached an average of 12,800 jin and 1,338 jin respectively. Last year, the county's 120,000 mu of sugar cane fields produced 102,000 dun of sugar, or an average of 1,580 jin of sugar per mu. [Beijing XINHUA Domestic Service in Chinese 0701 GMT 10 Aug 80 OW]

CSO: 4007

LARGE NUMBERS OF CATTLE DIE

OW231415 Beijing XINHUA Domestic Service in Chinese 0746 GMT 23 Aug 80

[Report by He Dongjun and He Maoji, XINHUA Correspondents]

[Excerpts] Lanzhou, 23 Aug--It was the golden season for grazing when we arrived in the pastoral area of the Gannan Tibetan Autonomous Prefecture, Gansu. Normally, the period for fattening cattle is July and August, and herds of cattle are driven to the summer grazing lands during this period. But we saw many herds of oxen along the highway and in the vicinities of residential areas. What surprised us was the fact that even the baby calves were not allowed to sip milk and were taken away from the mothers almost immediately after the calves began to suckle.

Most summer grazing lands are far away from the commune herdsmen's residential areas and are inaccessible to milk-collecting trucks. For this reason, the herdsmen have no choice but to graze their cattle in the accessible winter pastoral areas where they can sell their milk. Another reason is that over the past years the commune herdsmen have had to fulfill dairy products output plans and fresh milk procurement quotas, and they are used to drinking milk tea and using butter for cooking. Under these circumstances, they have no choice but to get as much milk as possible and let the mother cows feed the calves as little as possible.

As far as we understand, this practice of only serving immediate interests has had serious consequences. Forst of all, the calves are underfed and their death rate has been high owing to malnutrition and other weaknesses. Each ox turned over to the state at the present time can provide only 80 to 90 jin of meat instead of more than 200 jin as during the 1950s. Every spring 200,000 to 300,000 head of cattle die of malnutrition in the prefecture.

CSO: 4007

BRIEFS

EARLY RICE HARVEST--Recently a responsible person of the Guangdong Agricultural Committee told our reporter, "Guangdong's early rice harvest this year could still equal the bumper harvest level of last year." Although the early rice growth was good, successive typhoons, No. 6, 7, 8 and 9, in mid- and late July hit our province during the early yellow ripe stage of the early rice causing definite losses through shattering and lodging. Other crops such as rubber, sugarcane, jute and fruit also incurred losses. [Hong Kong TA KUNG PAO in Chinese 6 Aug 80 p 1]

LATE RICE TRANSPLANTING--At present Guangdong has already transplanted more than 30 million mu of late rice, accounting for about 90 percent of the planned late rice area. At the same time several late autumn crops such as sweet potatoes, peanuts, soybeans and dryland grains are also being planted. [Guangzhou NANFANG RIBAO in Chinese 12 Aug 80 p 1]

SHAOGUAN PREFECTURE LATE RICE--As of 5 August Shaoguan Prefecture had transplanted 2.12 million mu of late rice, accounting for 73 percent of the area to be transplanted. The six counties of Lechang, Nanxiong, Shixing, Lian, Wengyuan and Liannan have all basically completed their transplanting tasks. The prefecture plans to have 1.1 million mu of "Zayou" rice and more than 700,000 mu of "Guichao" rice, both improved varieties of rice. [Guangzhou NANFANG RIBAO in Chinese 7 Aug 80 p 1]

MEIXIAN PREFECTURE LATE RICE--As of 6 August Meixian Prefecture had already completed 78 percent of its late rice transplanting plan. This is more than the corresponding period in 1979. Mei County, the suburbs of Meizhou City and Wuhua County have 90 percent of their transplanting plans completed. [Guangzhou NANFANG RIBAO in Chinese 7 Aug 80 p 1]

CSO: 4007

PROVINCIAL GOVERNOR ON PROMOTING DIVERSIFIED ECONOMY

OW222052 Beijing Domestic Service in Mandarin 1200 GMT 22 Aug 80

[Text] On behalf of the Hebei Provincial CCP Committee, Li Erzhong, secretary of the Provincial CCP Committee and provincial governor, recently addressed an agricultural work conference held by the Provincial CCP Committee. He stressed that the relationship between a diversified economy and grain production should be handled well when developing a diversified economy through exploitation of the advantages and that efforts should be made to promote a diversified economy without reducing grain output.

Taking into consideration the overall situation in Hebei Province, the Provincial CCP Committee called for exploiting advantages in six aspects:

1. Exploit the advantage of farmland which gives high and stable yield along the Beijing-Guangzhou and Beijing-Shanghaiguan railway lines and in other places, and vigorously boost the output of grain, cotton and oil-bearing crops.

2. Mountainous areas should gradually center their attention on forestry and animal husbandry and vigorously engage in tree and grass planting.

3. The Zhanghiakou, Chengde and Bashang areas should gradually concentrate on stockbreeding and vigorously develop animal husbandry.

4. The Heilongjiang area should concentrate on agriculture and animal husbandry, interplant grain crops with grass, increase grain output and develop stockbreeding.

5. Vigorously develop fishery and aquatic products cultivation in reservoirs and low-lying and coastal areas.

6. Vigorously produce articles of handicraft art by exploiting the advantage of tradition handicraft and semihandicraft industry.

The Hebei Provincial CCP Committee deems it absolutely possible to simultaneously promote a diversified economy and increase grain output. The two major ways to achieve this are:

1. Make use of dialectical laws governing the relationship between agriculture, forestry and animal husbandry and between grain and cash crops to promote one another and achieve common progress.

2. Shake off the old practice of extensive cultivation, carry out intensive, scientific and meticulous farming and take particular trouble to increase per-unit grain output.

CSO: 4007

BRIEFS

DROUGHT--Shijiazuang, 13 Aug--Hebei Province has mobilized 4 million people to combat the effects of drought and irrigate farmlands day and night in an effort to save 6 million mu of oil-bearing crops and 8 million mu of cotton. The province has had little or no rain since the beginning of last month. Drought has drained more than 1,000 reservoirs and most of the rivers in the province. The Provincial Party Committee and Provincial People's Government issued a joint emergency circular on 8 August, calling for a mobilization of the people to do everything possible to save autumn crops. To support the effort, the Provincial People's Government has appropriated 10 million yuan to help communes and production brigades. Banks and credit cooperatives were authorized to issue loans to support the campaign. [Beijing XINHUA Domestic Service in Chinese 1132 GMT 13 Aug 80 OW]

TIANJIN DROUGHT MEETING--On the afternoon of 4 August, the Tianjin Municipal People's Government held the seventh executive meeting to study and discuss work on resisting drought and conserving water. Hu Qili, mayor, presided over the meeting. Since the beginning of summer there has been very little rain in north China and the rivers in the municipality have basically dried up. The level of underground water is also dropping. According to preliminary statistics, serious drought is affecting 2 million mu of farmland through the municipality. The water supply for the people's daily life and industrial production depends on the (Miyun) reservoir. After 14 July, they have relied on the water from the sea, rivers and lakes. According to meteorological departments, rainfall in north China will remain scarce. Drought will continue to worsen. It was pointed out at the meeting that the limited water in the seas and rivers are for the city. Without approval, farming area cannot use water in the seas and rivers. Water consumption for daily life must be reduced from the present 360,000 cubic meters to 300,000. [Tianjin City Service in Mandarin 2330 GMT 5 Aug 80 HK]

BEIJING DROUGHT--From 4 to 7 August, responsible comrades of the Beijing Municipal CCP Committee, the Standing Committee of the Municipal People's Congress, the Municipal People's Government and the Municipal CPPCC, went to seven disaster-affected districts and counties in the suburban areas to inspect the disaster situation and comfort the disaster-affected masses. (Wang Zhen), secretary of the Municipal CCP Committee, and Chen Xitong, vice mayor, held six different forums during their inspection to study the concrete measures to resist drought and relieve the disasters. They have solved some practical problems. Ma Yaoji and Yang Chunmao, vice chairmen of the Standing Committee of the Municipal People's Congress, also held forums to listen to reports. Guo Xianfui, vice mayor, urged the commune and brigade cadres to reaffirm their confidence and make use of local resources to develop a diversified economy. (Liao Moza), (Guo Buruo), (Lin Tong) and (Ding Gongman), vice chairmen of the Municipal CPPCC, highly praised the commune cadres and masses in stubbornly struggling against disasters. [HK150747 Beijing City Service in Mandarin 2300 GMT 8 Aug 80 HK]

CSO: 4007

BRIEFS

MORE SOYBEAN, WHEAT PLANTED--Of the more than 800,000 mu of wasteland reclaimed by people's communes in Heilongjiang during the first half of this year, half of it was planted to spring soybean and wheat crops. These crops are now growing well and bumper harvests are expected. Heilongjiang now has 120 million mu of farmland and still has 50 million mu of wasteland that can be reclaimed and turned into farmland. [Beijing RENMIN RIBAO in Chinese 5 Aug 80 p 1]

IMPORTED HOTHOUSE INSTALLED--Installation of a large vegetable hothouse imported from Holland was completed and put in operation in Harbin, Heilongjiang, last June. This modern hothouse has 5,270 square meters of floor space and the operation of all its windows and heating, ventilating, watering and fertilizer-applying systems are automatically controlled. It will provide experience on hos to grow vegetables by factory methods and in all seasons in northern China. [Beijing RENMIN RIBAO in Chinese 13 Jul 80 p 2]

MORE HARVEST COMBINES--In support of an expected bumper wheat harvest, 787 large harvest combines have been shipped from factories to Heihe, Hejiang and Nenjiang prefectures, the main wheat producing areas of Heilongjiang. This figure is 53.7 percent larger than in the same period of last year. There are now more than 11,300 large combines in the province ready for the harvest. [Beijing RENMIN RIBAO in Chinese 11 Jul 80 p 1]

MORE WASTELAND RECLAIMED--Since the beginning of this year, the Heilongjiang State Farms General Bureau has reclaimed 610,000 mu of wasteland, with 250,000 mu planted to spring soybeans. Heilongjiang's state farms are located on the Sanjiang Plain, Songnen Plain and on the slopes of the Xiaoxingan Mountains. They have large areas of wasteland, and their farming operation is 80 percent mechanized. In the past 2 years, they reclaimed 3.32 million mu of wasteland. [Beijing RENMIN RIBAO in Chinese 5 Aug 80 p 1]

HEILONGJIANG FARM MACHINES--In the first half of 1980, the department concerned of the state allocated some 6,900 large and medium-sized tractors and some 12,000 large farm tools to help Heilongjiang Province strengthen the mechanization of agriculture and the building of a marketable grain base. In the meantime, the province also produced some 3,000 walking tractors in developing this work. Owing to a good wheat crop, departments concerned have transported some 700 wheat harvesters to the province. Some 600 more wheat harvesters will soon be transported here. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 21 Jul 80 SK]

CSO: 4007

BRIEFS

GOAT MILK BEING SPOILED--Suburban area of Zhengzhou City, one of the milk goats producing bases of China, produces 120,000 jin of goat milk a day during the peak milk producing period. The Zhengzhou City Dairy Products Plant, however, can process only 80,000 jin of goat milk a day, leaving in the hands of peasants 40,000 jin to be spoiled because there is no market for the milk. Due to shortage of construction funds and material, an expansion project for this plant will take two extra years to complete. Local peasants and factory workers have asked departments concerned for aid to solve this problem. Last year this area produced 11.88 million jin of goat milk. [Beijing RENMIN RIBAO in Chinese 17 Jul 80 p 1]

CSO: 4007

YOUNG EDUCATED CHINESE WORK ON HUNAN FARMS, ENTERPRISES

OW131242 Beijing XINHUA in English 1232 GMT 13 Aug 80

[Text] Beijing, 13 Aug (XINHUA)--Hongqi farm of Xiangtan City in Hunan Province is one of the 8,000 enterprises and farms giving work to half a million young educated city people on the outskirts of China's cities and towns, the State Bureau of Labour said today.

The farm now has 1,500 workers, 400 of them being local commune members who are the backbone of agricultural production.

The farm has 160 hectares of farmland, including land reclaimed by the young educated people. The bulk of the land is for fruit trees, tea shrubs and peanuts.

In the past three years, the farm supplied the domestic and foreign market with 429 tons of citrus fruit, 64 tons of tea, 5,600 pigs and 2,000 tons of vegetables, as well as water melons, live fish, honey, mushroom and soybeans.

The farm has eight factories including an electrical machinery plant, a tannery and a tea processing unit. These factories also serve industries in the city.

The farm has two stores that sell its products exclusively. In this way, it combines production, processing and selling.

Each of the young city people made an average of 43 yuan every month last year, about the same as a grade three worker in the city. The workers' medical expenses, half of the medical fees for their family members, rent, water and electricity are all covered by the farm.

The farm runs a nursery, a kindergarten and a primary school, as well as a library, and other facilities.

Many cities and towns have incorporated such enterprises into their development programs and plan to turn them into satellites.

CSO: 4020

JIANGSU

AGRICULTURAL CONTRACTS POPULARIZED IN NANTONG PREFECTURE

Beijing RENMIN RIBAO in Chinese 28 May 80 p 2

[Article "Nantong Prefecture Puts Contract System Into Practice Throughout Agriculture, Uses Economic Methods for Management of Agriculture"]

[Text] Beginning this year, Nantong Prefecture in Jiangsu Province has put the contract system into effect in production, procurement, and marketing throughout agriculture, thus further implementing the party's various policies for rural villages. This has aroused enthusiasm for production on the part of the broad masses of cadres and commune members.

Nantong Prefecture is a major cotton-producing region of our country. In order that communes and brigades may consciously develop agricultural production under the guidance of the state plan, form a proper relationship between the growing of grain and cotton, and pursue a program in which cotton is king, the prefectural CCP committee decided early this year to apply economic methods to the management of agriculture by putting the contract system into practice throughout agriculture with the signing of agricultural contracts between prefectures and counties, counties and communes, and communes and production brigades. These contracts will be acted upon by the economic units concerned with grain, supply and marketing, commerce, and agriculture in the prefectures, counties, and communes, and signed separately by counties, communes, and production brigades, with the former being party B and the latter being party A. The contracts provide for the completion of production and offering for sale, in normal crop years, of fixed quota amounts of grain, cotton, oil, and hogs by party A. Party B guarantees to provide a fixed amount of commodity grain, chemical fertilizer, agricultural chemicals, and such means of production in the proper execution of policies on purchase prices to be paid for agricultural sideline production and incentive sales. If either party fails for inadequate reasons to complete the duties stipulated in the contracts, that party will become liable for certain economic obligations. Actual achievements during the past 2 years will be generally used for reference as contract guidelines, and contracts will be concluded following repeated discussions by both parties to make them reliable, whil[illegible]ing for unforeseen circumstances.

Once agricultural contracts were fully instituted throughout Nantong Prefecture, the cotton farmers' concerns about getting grain to eat were resolved and a better arrangement in the relationship between grain and cotton and grain production was reached. Since the cotton-growing area in this prefecture is large, it is not self-sufficient in grain and has to depend on the state for part of its supply. Formerly, the amount of grain to be supplied annually to cotton farmers was decided on only at the end of each year. Ordinarily, cotton farmers did not have a very good idea of how much grain they would have to eat. As a result, grain frequently crowded cotton on the land, and the fertilizing and care of grain were placed ahead of those of cotton. Some places kept some land for "crop rotation for subsistence purposes." If the summer grain crop had been a good one, they would grow cotton, but if it had been poor they would grow more grain. Now, with the signing of the contracts whereby each production team must produce so much grain and cotton annually according to the state plan, and whereby they are able to be supplied with so much grain, the amount of grain for consumption by the cotton farmers will be set at the beginning of the year. After the contracts were signed, many communes and brigades made appropriate increases in the area planted to cotton.

Grain supply and sales and commercial units also intensified their sense of responsibility in pursuit of their aid to agricultural work. Following the signing of contracts, these units held a special conference for the conscientious study of how they could guarantee the supply and measures for doing a good job in rendering support to agriculture. In order to assure timely supply of chemical fertilizer, agricultural chemicals, plastic sheeting, bamboo slats, and such items used in agriculture, the supply and marketing units used every means at their command to organize sources of supply and to transport the materials. During the first quarter of this year, the amount of fertilizer hauled into the entire prefecture was 50,000 tons more than for the same period last year, and the amount of agricultural chemicals was double the amount hauled in during the same period last year. All echelons of supply and marketing and commercial units also diligently carried out factfinding work so as to be able to know what was going on at any given time. They had a very clear idea about how much anything used in agriculture was needed in each county, commune, and brigade, what variety was needed, what model, and when it was needed. As a result, they remained on top of the supply of goods.

9432
CSO: 4007

BRIEFS

FISH OUTPUT--Over 210,000 dan of fish were caught from the 8 large lakes in Jiangsu during the first half of this year, an increase of 37 percent over the same period of last year, while that from Hongze Lake was 1.5 times greater. [Beijing RENMIN RIBAO in Chinese 16 Aug 80 p 2]

MORE BEES RAISED IN JIANGSU--Despite low temperatures and/or rainy weather during spring and summer, over 136,000 hives of bees are being raised in Jiangsu this year, an increase of 5,000 hives over last year. [Nanjing XINHUA RIBAO in Chinese 4 Aug 80 p 1]

VEGETABLE CROPS DAMAGED--Recent rains and typhoons severely damaged nearly 2,000 mu of vegetable crops in the suburbs of Nantong City, Jiangsu. Vegetable growers are now replanting Chinese cabbage and beans. As of now, 1,700 mu have been planted, and field management has been strengthened on more than 2,700 mu of existing vegetable crops. [Nanjing XINHUA RIBAO in Chinese 4 Aug 80 p 1]

CROP HARVEST--Suzhou prefecture in Jiangsu has reaped a bumper harvest of summer-ripening crops this year and overfulfilled the state plan for procuring such crops. By 26 July, the prefecture turned in to the state 531 million jin of wheat and 66.27 million jin of rapeseeds, thus overfulfilling the state procurement plan by 6.3 percent and 1.9 percent respectively. [Beijing Domestic Service in Mandarin 0400 GMT 11 Aug 80 OW]

CSO: 4007

COMMUNES, BRIGADES TO MANAGE STATE FORESTS ASSIGNED

OW211933 Beijing XINHUA Domestic Service in Chinese 0747 GMT 21 Aug 80

[Excerpts] Changchun, 21 Aug--According to a report by XINHUA reporters Wang Shensheng and Wang Jinghe, the Jilin Provincial CCP Committee has carried out an experiment in Wangqing County, located in the Changbaishan forest area, by assigning communes and brigades to manage part of the state-owned forests near the villages. This is being done in the interests of the state, the collective and the individual peasants and has paved the way for a rapid development in forestry and a prosperous economy in the mountainous area.

The Changbaishan forest area in Jilin Province covers 24 counties and municipalities and 425 communes in Yanbian Prefecture, Jilin Municipality and Tonghua Prefecture. There are very favorable conditions for developing forestry in this mountainous and densely forested area with its rich natural resources. However, crippled by all kinds of acute contradictions, forestry in this area has remained depressed for a long time. On the one hand, most of the forest and barren hills and land in this area are owned by the state. While engaging in tree-felling assignments, the state forestry departments have very limited resources to be used in cultivating trees and protecting the forests. This has resulted in a serious disproportion in the felling and growing of trees. There are more barren hills, and forest fires break out frequently. There has been a tremendous waste because what is leftover from tree felling is not fully used. On the other hand, the several million peasants who have lived in the forest area for generations do not have the land to afforest nor the trees to cultivate. Since they cannot live off the mountains on which they live, these peasants confine themselves to cultivating the limited farmland in the gullies. As population increases and per-capita land area shrinks, there are fewer ways to develop production and the peasants become less enthusiastic about protecting forest resources because they cannot become rich. The result is frequent indiscriminate felling of trees and deforestation for reclamation.

In view of this, Jilin Province, having obtained the state council's approval, decided to experiment with Wangqing County by assigning communes and brigades to manage part of the state-owned barren hills and land, shrubs, forests with sparsely-spaced trees and small areas of natural low-quality secondary forests which are close to villages.

The experiment in Wangqing County started in October last year and was basically completed in April this year. Facts bear out the correctness of this measure by the Jilin Provincial CCP Committee. Wangqing County has made encouraging improvements in forestry; cadres and peasants of the communes and brigades have enhanced their enthusiasm for protecting the forests. There are fewer reports of forest fires and indiscriminate tree-felling has basically been checked. In the past, Wangqing County was frequently plagued by forest fires, as many as 80 to 90 cases a year. Since spring this year, there have only been six reports of forest fires, only one forest fire broke out in the forest zone managed by the communes and brigades. Second, the peasants have demonstrated greater enthusiasm than in any other year for nursing saplings and afforestation. This year the acreage of saplings in the county has increased to 62 shang [a land measure equal to 15 mu] from 29 shang 5 mu in the past. In 1979, the county planned to afforest 13,000 mu of land but ended up with only 11,000 mu. This year, despite a shortage of nursery stock, the communes and brigades managed to afforest 25,000 mu of land with better quality than in previous years. Third, the communes and brigades have begun to make reasonable use of leftovers from tree-felling, thereby increasing their income.

CSO: 4007

BRIEFS

PLASTIC SHEDS FOR TREE SAPLINGS--The Daxinggou Forestry Bureau of the Zhangbaishan Forest Area in Jilin Province has successfully used large plastic sheds to raise tree saplings. This new method can lengthen the saplings' growth period by about 50 days, making it possible to carry out afforestation activities throughout the year. Moreover, saplings cultivated in the sheds grow rapidly and have well-developed roots, good adaptability and a high survival rate. The bureau has used this method to raise 2.14 million saplings of various kinds of trees, of which some 95,000 had been transplanted on mountains. Their survival rate was 96.1 percent. [Beijing RENMIN RIBAO in Chinese 13 Jun 80 p 2]

CSO: 4007

LIAONING

BRIEFS

SAPLING PRODUCTION--Liaoning Province has completed 1980 sapling cultivation on the acreage of 475,000 mu and has surpassed the fixed state assignment by 25,000 mu, surpassing acreage cultivated in 1979 by 13.8 percent. This sapling cultivation achievement can be attributed to communes and brigades concerned across the province that have increased their sapling cultivation acreage in collectively owned farms successfully enforcing the system of responsibility in production. [Shenyang Liaoning Provincial Service in Mandarin 1100 GMT 14 Aug 80 SK]

CSO: 4007

BRIEFS

TAXATION--The Qinghai Provincial People's Government recently decided to exempt poor agricultural and animal husbandry production teams from taxation between 1980 and 1982 in the hope of lightening their burdens and helping them to develop production. Agricultural production teams which have an average of food grain distribution around 300 jin and an average income of less than 50 yuan, 55 yuan and 75 yuan per capita are regarded as poor teams. Animal husbandry production teams which have less than 25 head of livestock per capita are regarded as poor teams. They are thus entitled to tax exemptions for 3 years. [Xining Qinghai Provincial Service in Mandarin 2330 GMT 8 Aug 80 SK]

CSO: 4007

IRRATIONAL USE OF CROP VARIETIES IMPAIRS OUTPUT

Beijing RENMIN RIBAO in Chinese 23 Jun 80 p 2

[Article by Mao Zhicun [3029 5268 1317]: "Getting Output From Rational Distribution of Crop Varieties"]

[Text] Last summer and autumn, the Shandong Provincial Agriculture Bureau and seed companies at all levels organized personnel to make a survey of the growth of the wheat, corn, sweet potato, cotton, and peanut crops throughout the province. The results of this survey have shown that the irrational pattern of crop varieties is a major problem blocking the rapid growth of agricultural production at the present time. Take wheat, for example, In the entire province there are only 20 million mu of land suitable for the sowing of fine varieties with high and moderate fertility and moisture needs, while the area actually planted to such wheat amounts to more than 39 million mu. Varieties requiring high fertility and moisture are being grown on more than 19 million mu of dry, alkaline, infertile land. As a result, there is no increase in yields, but rather reduced yields.

The Zhangqiao Brigade in Huantai County has 300 mu of dry, mountainous, infertile soil; on 100 mu of this land they sowed the fine variety Huanqun No 4, which has low fertility and moisture requirements. Resulting yields per mu ran to 560 jin. Another 100 mu were sown in fine variety Taishan No 1, which has moderate fertility and moisture requirements. Yields per mu fell to 370 jin. On the remaining 100 mu they planted Zixuan No 2, which has high fertility and moisture requirements. Yields per mu were only 251 jin. A survey of the situation in Taian, Linyi, Heze, and Jining prefectures demonstrated that whenever varieties with high fertility and moisture needs were planted on dry, alkaline, infertile soil, there was a general decline in yields of some 40 to 148 jin. Figuring an average decline in yields of 70 jin per mu, for the more than 19 million mu of wheat throughout Shandong Province last year there was a lost harvest of more than 1.33 billion jin of grain--an astounding figure.

A large body of facts shows that different varieties of the same crop are suited to certain regions. Selection of fine varieties must begin with the realities of the locale. Bumper harvests can be harvested only when crops are planted in accordance with the natural conditions and the farming system of different areas. If there is a blind introduction of varieties, natural laws will be violated and losses created.

Insufficient attention is presently being given by the authorities concerned to the rational distribution of varieties, and measures are not vigorous enough. In spreading fine varieties, they do not select varieties in accordance with different natural conditions and the level of production. Instead, without inquiring about the locale or its conditions, they blindly introduce any variety as long as it is a high-yield one. As a result, performance disappoints expectations. Not only does output decline, but transportation expenses are increased. In breeding work too, some comrades involved in work with seeds also lack an overall viewpoint about the rational distribution of varieties. They frequently think only of plains and river valleys in propagating varieties with high and medium fertility and cold regions, and the waterlogged low lying regions with alkaline soil that needs varieties that can stand up to poor fertility, are hardy to cold, and can tolerate alkalinity. When the peasants in the vast mountainous areas and the low lying waterlogged areas with alkaline soil lack suitable varieties, they have no choice but to use varieties with high fertility and moisture needs, or use the old varieties of the 1950's instead.

What has to be done to get a rational distribution of varieties? First of all, every level of leadership in agricultural and scientific research departments has to truly give serious attention to this problem. Distribution of varieties according to district is a fundamental measure for getting the most out of the high-yield characteristics of fine varieties. Take the case of wheat in Shandong Province, for example. Through preliminary rational distribution of varieties, an increase of more than 1.3 billion jin of grain can be harvested. In a situation such as this, with benefits for both the state and the people, effective measures must be taken to do something realistic. Each locale has to undertake a one-time complete survey of the natural conditions, production levels, and crop varieties in its local area, figuring out which varieties "make the grade," which "do not make the grade," and what varieties are required. Next, they should actively organize the units concerned to propagate and promote the needed different varieties.

Then, each locale should set up a complete organization and management system for variety evaluation, so as to overcome the chaotic situation in which varieties are promoted blindly.

9432
CSO: 4007

BRIEFS

DROUGHT REPORTED IN DEZHOU PREFECTURE--Since the beginning of July, the average rainfall in Dezhou Prefecture, Shandong, has been 9 mm only and that of 8 counties only 2-3 mm. With the exception of Qihe, Jiyang and Pingyuan counties, where the drought conditions are less severe, all other counties in this prefecture have been hit by severe droughts, which severely affected more than 4 million mu of land. [Jinan DAZHONG RIBAO in Chinese 22 Jul 80 p 1]

NEW STRAIN OF SWEET POTATO PROMOTED--More than 1.3 million mu of a new variety of sweet potato, known as "Xushu 18," have been planted in Tai'an Prefecture of Shandong this year, accounting for over 80 percent of the total sweet potato acreage in this prefecture. This new variety is noted for its disease resistance and high yielding ability. [Beijing GUANGMING RIBAO in Chinese 20 Jul 80 p 2]

CSO: 4007

UTILIZING NATURAL CONDITIONS TO GAIN BUMPER HARVESTS URGED

Beijing NONGCUN KEXUE SHIYAN [RURAL SCIENTIFIC EXPERIMENTS] in Chinese No 1, 1980, pp 6-7

[Article by Long Fei [7893 7378] of the Sichuan Provincial Agricultural Bureau: "Seize Bumper Harvests by Stimulating Benefits and Avoiding Damage"]

[Text] After crushing the "gang of four," our province took a series of measures that suited the local conditions and seized initiative measures. Although there were several consecutive years of drought and natural disasters, we still achieved bumper harvests in agriculture. In 1977 and 1978, food grain production increased over 10 billion jin, and the yield of economic crops increased over all. In 1979, a good harvest was also realized.

Stimulating the benefits and avoiding damage means to engage in agricultural production with measures suited to local conditions, to start out from practical aspects, to fully utilize the advantages of natural climate, to develop superiority, to strive to avoid damaging climate, especially summer drought and low temperatures in summer during drought and autumn, and change the unfavorable to the favorable.

What are the actual measures?

Guide Favorably According to Trends; Develop Crops that Can Be Harvested in Summer

The Sichuan Basin is mild in climate in winter and spring. The frost period is short and cumulative temperature is high. Here, from November to April of the next year, cumulative temperature reaches 1800 to 2200 degrees. At most places, daily average temperatures below 0°C do not occur. The autumn and winter sown crops basically can grow continuously. The natural disasters during this period are fewer than in summer and autumn. Therefore, it is very favorable to developing crops that can be harvested in summer. But, reviewing our province's history of developing crops that can be harvested in summer, we see that although the area of summer harvested crops is gradually expanding, but as of 1976, the entire province only had over

20 million mu of winter paddy rice fields and 8 million mu of winter fallow land. As water conservancy conditions gradually improve, some can be rebuilt, and by developing summer harvested crops, the two consecutive years of autumn drought starting from 1977 were beneficial to the development of summer harvested crops. Therefore, we emphasized grasping the reformation of winter paddy rice fields in the hilly regions to develop wheat and rape. In the remote mountain regions, we emphasized grasping the utilization of winter fallow land to develop potatoes. At the same time, we also grasped tightly the quality of sowing and field management. Therefore, overall increased number harvests were achieved in summer-harvested crops for 2 consecutive years. In 1979, the area of summer food crops increased by more than 9,500,000 mu over that in 1977. Rapeseed yield increased 60 percent. Practice shows developing summer harvested crops is an effective way to fully utilize our province's natural conditions and seize increased yields in agriculture.

Reasonable Distribution, Parallel Development of Intermediate Rice in Two Seasons

Paddy rice is our province's major food grain crop. Since the founding of the nation, our province's paddy rice production did develop, but compared to other crops the speed of development was relatively slow. Paddy rice production throughout the province in 1976 showed an increase of 36.6 percent over that in 1949. During the same period, dry food crops increased 1.15 times. The reason is that in addition to poor water conservancy conditions which affect the area of paddy rice and unit area yield, there was also a blindness in reforming the planting system of paddy rice fields. Survey and analysis of the entire province's climate and conditions of production were insufficient. Double season rice was anxiously expanded and intermediate rice that constituted 80 to 90 percent of the area of paddy rice was neglected. This produced a yield of double season rice that was not high and the yield of intermediate rice could not be raised. Meteorological data showed that inside the Sichuan Basin, daily average temperature lower than 12°C and continuous for 4 days in March frequently occurred. Even in southern Sichuan where the temperatures were relatively high, the frequency of occurrence during the first 10 days was 30 to 50 percent. During the middle and the last 10 days of the month, the frequency of occurrence in most of the regions dropped to below 20 percent but in the northwest and the northeast, the percentage still was between 20 and 40 percent. This is the time and season for cultivating early rice seedlings. Because of the frequent attack by cold fronts, rotten seeds and rotten seedlings frequently occurred. By the middle and the last 10 days of September when the late rice headed and flowered, daily average temperatures below 20°C and continuous for 3 days frequently occurred. This was unfavorable to heading and flowering of paddy rice and easily caused the formation of unfilled panicles. Therefore, during the 21 years from 1956 to 1976, per mu yield of early rice always remained at over 400 jin and late rice at over 200 jin. Conversely, during the growth season of intermediate rice the temperatures are relatively stable, damage is slight, potential is great, and the masses also have rich experience in planting intermediate rice well. If the area of double season rice in places where water conservancy conditions are poor, labor is insufficient, the level of mechanization is low and climatic conditions are poor, can be lessened, and if the labor force and fertilizers used for double season rice in the past could be concentrated for use in the production of intermediate rice, then, the production of intermediate rice will benefit, and this will also benefit the elevation of the production of double season rice. Therefore, in spring of 1977 the provincial committee proposed the policy to "exert all out efforts to engage in the planting of intermediate rice, greatly raise unit area production, and at the same time create conditions and suit measures to local circumstances to develop double season rice." The distribution was adjusted and intermediate rice was expanded and double season rice was reduced. Thus, the rapid development of paddy rice production was stimulated. This year, the area of intermediate rice throughout the entire province increased by over 3.6 million mu and the area of double season rice decreased by over 3.8 million mu. Unit area yield of early, intermediate and late rice greatly increased. A per mu increase of 94 jin in yield resulted in an elevation of the total yield by 11 percent.

Throughout the entire province, even though the area of double season rice decreased, in the southeastern regions of Sichuan where it is suitable for the growth of double season rice, the pattern of cultivating high yielding double season rice was ceaselessly explored and, therefore, there was also progress. In particular, the success of planting hybrid rice opened up a broad future for the development of double season rice. According to a survey of 21 typical commune brigades, over 16,000 mu of double season rice fields were "fields that produced a yield double the guideline," "fields that produced a ton of food grains" and even "fields that yielded three times the guideline." They provided experience for the future development of double season rice with measures suited to local circumstances.

Take the Initiative in Controlling Drought; If the Waterways Cannot be Passed, the Dryroads are Used

Drought is our province's major natural disaster. Summer drought poses the greatest threat. From the 1950's to 1970's, drought gradually increased, semi-drought and serious drought during the 1970's occurred almost every year. The method to fight against drought in the past was to build water conservancy projects and mainly rely on storing water in the rice fields for wintering and to prepare for transplanting the next year or for transplanting during the spring rains. In some fields that were at a higher elevation and that were poor in retaining water, the rice plants could not winter with the water stored in the fields and frequently the fields became reverse dry fields. At some places, transplanting had to wait for the rain to fall. During summer drought, plants frequently could not be transplanted, and even when the plants were transplanted in spite of the weather, the transplanting was usually late and the seedlings were old or the situation of "washing your hands dry" was created. If sowing was delayed, and when summer drought was encountered, "rubbing will assure dryness." The yields were not high. The masses described these fields as "pulling the legs."

To fight drought, water conservancy must be done well. The fields and the soil must be improved. Trees must be planted to create forests. The production conditions must be fundamentally changed. At the same time, the planting system must be reformed and the cultivation techniques must be improved. Before the problem of water conservancy is solved, can "pulling leg fields" be changed to high yielding fields? The provincial committee proposed "to create beneficial conditions and provide guidance according to the situation, take the dry roads when the waterways are blocked, take the initiative in controlling drought, resist drought to seize bumper harvests" upon the basis of survey and research. Some fields on high ground where water supply cannot be assured were changed to plant corn interplanted with yams or potatoes with corn and vetch as a triple cropping field. Fields where the water supply was insufficient during the early period but with assured seepage and irrigation during the late period or where labor and seedlings were insufficient but intermediate rice could not be transplanted in time were planted first with corn or a single season of green manure with a short growth period and then with a season of late rice, potato, corn, rice or wheat, green manure and rice. To regulate the season for water use the demands on labor were spread out. In this way, a new path can be found to increase multiple planting of rice fields simulaneously with efforts to resist drought and seize bumper harvests.

Changing the Planting System in Drylands; Avoid or Reduce the Threat of Summer Drought

Most of our province's dryland is planted with corn and yams. In the eastern part of the basin during the middle and last 10 days of July, summer-drought occurs regularly. At the central part of the basin, summer and summer-drought alternate. At this time, corn planted following wheat heads and flowers. When it encounters high temperatures and summer-drought, the yield decreases if the drought is slight. If the drought is severe, not even one grain is harvested. Seedlings of yams are cultivated late, transplanted late and when they encounter summer-drought, the vines and leaves cannot grow and the yield is low and unstable. In practice, the masses have begun to reserve rows using wheat since 1971 and have sown early corn in between rows. After harvesting wheat, yams were interplanted in a triple cropping a year system. Because corn was sown and harvested early, it avoided summer drought and at the same time shading of yams by corn was reduced and this provided a favorable condition for the early transplanting and early development of yams and for increasing the ability of yams to resist drought. For consecutive years, the triple cropping system produced high yields and per mu yield of food grains reached a thousand jin. The provincial committee popularized this experience in 1977 and during the past 3 years, the area of spring sown corn throughout the province expanded from over 4 million mu to over 12 million mu, constituting 50 percent of the area of corn of the entire province.

With the additional measures to popularize hybrid varieties, the unit area yield and total yield corn throughout the province in 1977 increased by 20 percent over that of 1976, and in 1978, the unit yield of corn rose again by 6 percent, and total yield increased by 17.8 percent. In 1979, a relatively large increase in yield was also realized. In the production of yams, the experience of consecutive measures of "early transplanting, thickening of the soil, compilation of compost, using superior varieties, fertilization and using high temperature kilns" was summarized and popularized. The yield also created the best level in history, and the yield in 1978 showed a 48 percent increase over that in 1976 and an increase of 3.6 percent over the highest historical level of 1973.

Practice proves that implementing measures that suit the local conditions in our province, stimulating benefits and avoiding damages to seize the initiative production measures and implementing scientific planting will sustain increased yield in agriculture.

9296
CSO: 4007

BRIEFS

PRICE OF FARM TRUCK DROPPED--The ex-factory price per "Shancheng" [Mountain Town; 1472 1004] brand BB130 farm diesel truck manufactured by the Chongqing Farm Motor Vehicle Plant dropped from 20,000 yuan in 1979 to 16,500 yuan in 1980. [Chengdu SICHUAN RIBAO in Chinese 12 May 80 p 1]

SILKWORM COCOON OUTPUT--Despite rainy weather in the spring and diseases and insect pests, Sichuan reaped a bumper harvest of spring silk cocoons this year, with total output exceeding 720,000 dan, a net increase of 120,000 dan or 20 percent over the comparable period of last year. Communes and production brigades in the sericulture areas earned more than 100 million yuan from sales of cocoons. [Chengdu SICHUAN RIBAO in Chinese 4 Jul 80 p 1]

CSO: 4007

REGULATION ISSUED ON LEVYING ANIMAL HUSBANDRY TAX

OW030931 Beijing Xinhua Domestic Service in Chinese 1209 GMT 2 Jul 80

[Text] Urumqi, 2 Jul--Proceeding from the characteristics of its pastoral area, the Xinjiang Uygur Autonomous Regional People's Government has once again formulated and promulgated a "regulation on levying animal husbandry tax in Xinjiang Uygur Autonomous Region (on a trial basis)." On the basis of the guidelines issued by the central authorities on China's policy of levying animal husbandry tax and in close connection with the specific conditions of the pastoral economy in Xinjiang, the Xinjiang Uygur Autonomous Regional People's Government has after conscientious investigation and study formulated a new measure for levying animal husbandry tax. The new regulation on levying animal husbandry tax will help the herdsmen of all nationalities to rest and build up strength. It reflects the concern of the party and the government for the herdsmen of all nationalities.

The new regulation on levying animal husbandry tax stipulates that the tax will be levied on the basis of the total animal husbandry income instead of the number of animals in the past, and the tax rate will be lower than that in the past. The total animal husbandry tax revenue in the region will be reduced by approximately 50 percent. The policy of maintaining a fixed amount of tax for a period of 5 years will be implemented. Over a period of 5 years the burden of the herdsmen will remain the same; their income may increase without having to pay more tax.

The new regulation on levying animal husbandry tax also specifies the minimum income which is taxable and the amount of income which is tax free. Basic accounting units in agricultural areas and in semiagricultural and semipastoral areas where income from animal husbandry is less than 500 yuan per unit and those in pastoral areas where income from animal husbandry per capita is less than 60 yuan are exempted from paying animal husbandry tax. Special preferential treatment will be given to eight counties which are experiencing difficulties including Hotan, Moyu, Lop, Shule, Shufu, Bachu, Artux and Jiashi as specified by the autonomous region.

CSO: 4007

BRIEFS

LIVESTOCK--Xinhe county, Xinjiang, has increased its livestock to 480,000 heads, topping the highest previous record by 34,000 heads. [Urumqi Xinjiang Regional Service in Mandarin 1300 GMT 13 Aug 80 OW]

CSO: 4007

YUNNAN

STEPS TAKEN TO PROTECT, DEVELOP FORESTS

OW201221 Beijing XINHUA Domestic Service in Chinese 0123 GMT 20 Aug 80

[Report by XINHUA Reporter Qiu Jingdong]

[Excerpts] Kunming, 20 Aug--The Yunnan Provincial Party Committee has adopted vigorous measures to give scope to Yunnan's strong points, to protect its forests and to develop its forestry production in order to better the lot of people of all nationalities.

According to the statistics of the provincial forestry departments, approximately 50 percent of the province was forest-covered in the early post-liberation period. By 1975, however, the percentage had declined to 25, with the annual consumption rate of forest resources reaching 26 million cubic meters or twice the growth rate. The huge decline in forestry resources in the province has damaged the ecological balance in a number of areas, affected agricultural, livestock and sideline production and the people's livelihood, and caused frequent natural disasters.

The dire effects resulting from damage to forests have attracted the attention of the departments concerned. Since the second half of 1979, the Yunnan Provincial Party Committee and the people's government have on many occasions sent our investigation teams to various localities to discover problems on the forest front. After a careful study of the fact that Yunnan, a predominantly mountainous province, has 104 million mu of forests and ranks fourth in the nation's timber reserves, the Provincial Party Committee and the people's government decided that forestry is of special importance to the province and that its protection and development with due regard to the interests of the state, the collectives and the individuals will make forestry a permanent asset of the province and is an important way to improve the lot of the people of all nationalities in the province.

Based on this conclusion, the Provincial CCP Committee readjusted its forestry policy, including allocating a number of barren hills suitable for growing trees to rural commune members so that they could grow trees for fuel, timber or other economic requirements; defining forest ownership with due regard to the interests of the state, collectives and individuals;

and reforming the management system of forest industrial enterprises and trying the reformed system out in three forest bureaus. These readjustments, though preliminary, have achieved successes.

In order to further protect and develop forests, the Yunnan Provincial Party Committee recently held a meeting of prefectural and county party secretaries to seriously discuss forestry issues and to decide further measures to improve the situation on the forest front. The Provincial Party Committee asked various localities to rationally define forest ownership in accordance with the principle of giving consideration to the interests of the state, collectives and individuals. At present the primary task is to consider the peasants' interests and allocate a number of mountain forests to the collectives to operate. Existing land for alternate cultivation and fallow land in the rural areas may continue to be used for rotation crops, but it should not be further expanded. It is absolutely prohibited to make new farm land from forests. At the same time, efforts should be made to settle nomadic farmers and make them engage in farming in a permanent area. Forest, livestock and local products may be used to exchange grain from the state to solve food grain deficiency. The state may arrange appropriate amounts of food grain for the grain deficient area if there are no products available for exchange at the present.

The Provincial Party Committee also decided to protect the forests in the Jinshajiang forest zone in the upper reaches of the Changjiang River. Starting next year, a rational policy of combining felling with planting will be enforced. All units are required to plant one mu of trees for every mu felled. Whoever wantonly destroys forests will be sanctioned by economic measures or law in accordance with the specific cases.

CSO: 4007

BRIEFS

EARLY, LATE RICE--A leading person of the provincial party committee stated in an interview that because of low temperatures and much rain during the sowing and growing period of early rice this year, the ripening period was delayed. Consequently the period for harvesting early rice and transplanting late rice is short. This year the early rice area was less than last year. Thus, if the summer harvesting and planting is not done well, there can't be an increase in grain production this year. The leading person also stated that hybrid late rice is to account for 40 percent of the total late rice area, an increase of more than one million mu. [Hangzhou ZHEJIANG RIBAO in Chinese 23 Jul 80 p 1] On 16 August a meeting attended by Deputy Governor Yuan Fanglie, Provincial Agricultural Technician Hu Xiangquan [7579 7449 3123], Director of the Rice Institute of the Zhejiang Academy of Agricultural Sciences Dong Shijun [5516 0013 6874], agricultural technician from the Provincial Agricultural Department Zhang Zongwang [1728 1350 2489] as well as responsible comrades of the provincial agricultural committee, the agricultural department, the meteorological bureau, county agricultural bureaus and communes, was convened to discuss the autumn grain situation. Those attending held that although the temperatures are low, there is little sunshine and the late rice is slow to tiller, there still is a good foundation of plentiful fertilizer and large numbers of basic seedlings on which to build. By paying attention to drainage, fertilizer application and insect and disease control, an increase in the fall harvest could still be obtained. Other food grain crops such as sweet potatoes and corn are generally growing relatively well. Because of the decrease in output of the spring grains and early rice, strict attention must be paid to increasing the output of the fall grains. [Hangzhou ZHEJIANG RIBAO 18 Aug 80 p 1]

RICE CROPS--Xiaoshan county of Zhejiang Province has 342,000 mu of early rice and some of the crops has been affected by recent rainy weather. By 12 August, this county had turned in 6 million jin of grains to the state. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 15 Aug 80 OW]

COTTON PRODUCTION--Cixi county of Zhejiang Province has stepped up cotton field management. The county planted some 400,000 mu of cotton this year. Cotton production is seriously affected by 8 continuous days of rain since 30 July. [Hangzhou Zhejiang Provincial Service in Mandarin 0400 GMT 17 Aug 80 OW]

RICE CROPS--Wuyi county of Zhejiang Province has completed harvesting some 180,000 mu of early rice and sowing some 170,000 mu of late rice. Efforts are being made to promote field management of autumn crops. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 15 Aug 80 OW]

COTTON PRODUCTION--Lanxi county of Zhejiang Province steps up cotton field management to make up the losses caused by low temperature and rainy weather. This county has some 30,000 mu of cotton crops. [Hangzhou Zhejiang Provincial Service in Mandarin 1100 GMT 15 Aug 80 OW]

CSO: 4007

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A Squashing Technique for Chromosome in Wheat Endosperm...... Mu Sumei [4476 4790 2734], Northwest Botanical Institute, Wugong, Chinese Academy of Sciences (35)

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